

MOTOR AGE

Taking Father Time by the Forelock



By C. G. Sinsabaugh

OVER in the Fatherland they call it wanderlust, that irresistible desire to roam from place to place, often without any definite idea of location or destination, which infects rich and poor alike, only that with the poor it is a case of walking, while the wealthy and moderately rich whiz around in motor cars. The lure of the road is not to be denied, and the fascination of following an alluring bit of white, straight highway, dust-covered maybe, and lined on both sides by beautiful trees and with broad fields, well tilled, dotting the landscape for miles around, catches all of us. That probably accounts for the wanderings of many—why Glidden started out to visit every country in the world; why so many grow ambitious to travel from ocean to ocean; why some try to pass through every state and territory in the United States; why some become ambitious to gain fame by unusual stunts in the touring line in which a motor car is used.

An example of this is furnished at the present time by the rambles of the Premierites who now are on their

way to the Pacific coast. Were it not for this wanderlust why should forty or fifty well-to-do Americans take a couple of months to cross the continent, undergoing all sorts of hardships and discomforts—for touring not always is a bed of roses—in order that they may be able to boast of the feat? If one were looking for a rest,

T. V. WILDER

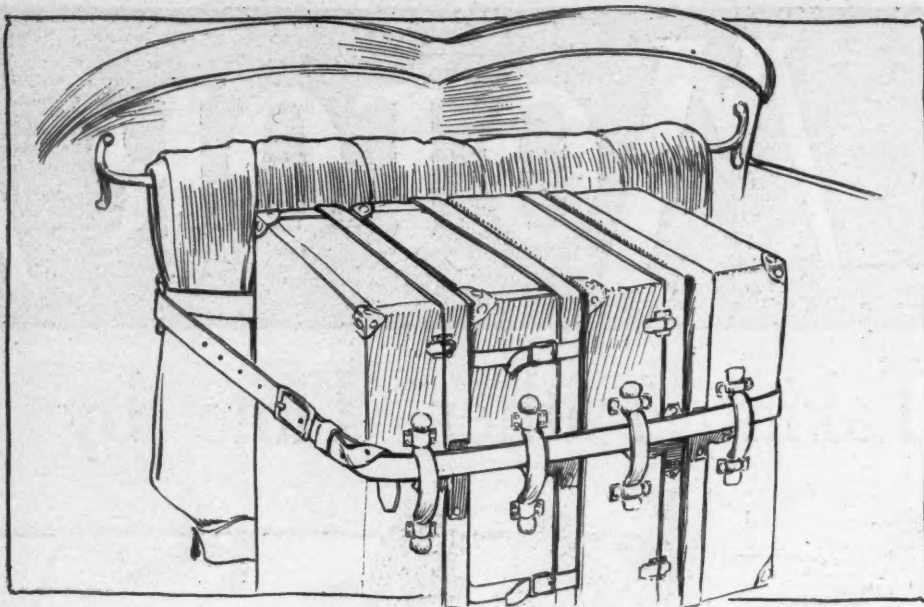


One of the disagreeable features of packing for touring is stowing away the side curtains. A special drawer to carry them is made to go under the rear seat.

how much easier it would be to go to some summer resort and use up one's vacation in ease and comparative comfort? No, it surely must be wanderlust in their case.

In the earlier days of motoring touring was no sinecure; it actually meant work and hardships. In cars that were so imperfect in their construction that a journey of a hundred miles was a feat out of the ordinary, those pioneers of a decade back were heroes and if wanderlust really was not responsible for this ambition to roam in such cars, what was? Those pioneers laid the groundwork for motoring as we find it today. Their adventurous trips pointed out the imperfections in cars and equipment of which designers of motor cars took advantage, and the result is that nowadays one can travel about the country in motor cars, confident in the knowledge that the cars are so stanchly built and so reliable that one is as certain to get to his destination by motor as by train. Even the puncture demon has been subdued to a certain extent, while it is rare to find a touring motorist laid up for repairs made necessary by mechanical troubles. Nowadays the modern motor car engine can be relied upon to keep running indefinitely.

Of course the motor car is not infallible; one cannot expect that even in the



There is a right way and a wrong way to pack suit cases in a tonneau. The right way is to stand them on end and strap them so they will be out of the way of the passengers.

golden days we are promised when the goal of perfection has been reached. But with the great growth of motoring one finds that the American people have prepared for it, and nowadays every little hamlet has its garage, while the motor car factories have made service their keynote and the wanderer in trouble finds that the telegraph will bring him relief without any great loss of time. System is a great thing and it is no better exemplified than in the case of the modern motor car and the tourist.

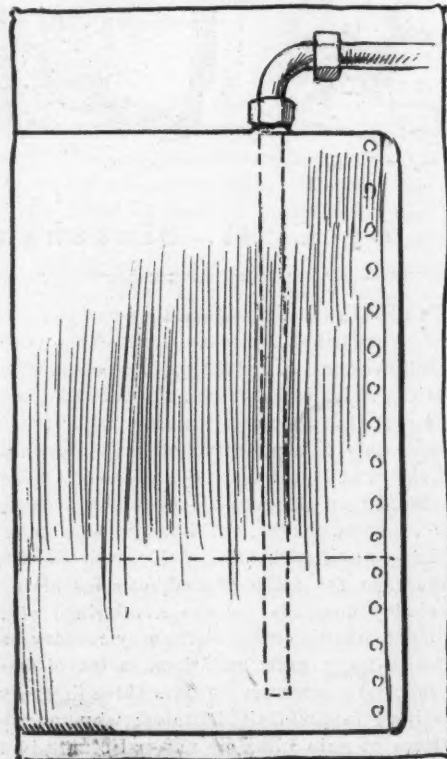
Back of it all, though, is something else—preparation. It is useless to have a magnificent motor car which never has failed you in city work and expect it to live up to its reputation in a journey of several thousands of miles unless the owner of it has anticipated what he is to encounter in his rambles and prepares for emergencies. The captain of a big ocean liner never would think of putting to sea unless he was certain his ship was ready for the voyage—that the bunkers were well stocked with coal, that the engines were in the pink of condition, that the crew was well drilled and that water and provisions enough for the voyage were on board. So it should be with the owner of a motor car contemplating a tour, no matter whether it is to be of a day's duration or a month. Anticipate and prepare—that's the motto.

It's all right to talk of the joys of roaming about with no definite idea of where one is going; to turn down every good road one comes to and put up for the night wherever one is when the sun disappears below the horizon; that's a fallacy. The modern motorist goes about it in a more systematic manner. He first of all decides upon the territory through which he is to travel; where his night stops will be and how much time he will devote to the trip. He secures all his road data, pin pricks the route in his Blue Book and then makes ready for the

outing. Maybe such a trip is nothing new to him, and if this is the case his past experience will stand him in good stead. He will know just what he has to carry and how to carry it. In the case of the novice, though, he has much to learn, and the more knowledge he gains before starting on a tour the better it will be for him after he gets out on the road.

System of the Veteran

When a veteran is making his plans for a tour he goes about it in a most systematic manner, with confidence based on knowledge gained in previous jaunts. First of all he has his route definitely outlined; then he has put his car into the

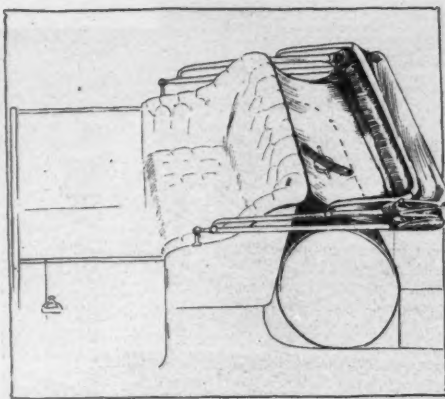


Provision now is made for a reserve supply of gasoline. The Lozier furnishes an extra pipe which enables the driver to reach an extra 5 gallons of fuel.

shop for an overhauling, not that it really needs it perhaps, but to be sure that everything loose has been tightened; that grease cups have been filled, that the oiler is working perfectly; that the wheel bearings are properly packed with grease; that there is plenty of lubricant in the transmission and differential; that the valves are well ground; that the spark plugs are cleaned and in condition; that his tool kit contains everything that will be needed, and a hundred and one other points that the experienced repairman will look after.

There is such a thing as overloading the car with unnecessary baggage and tools, anticipating too much trouble as it were, but the experienced tourist will weed out much that the novice would think necessary for the operation of the car. In the carrying of extra parts it of course depends upon the length of the journey to be undertaken. If it is to be an overland journey, then it would be foresight to carry along a couple of extra springs, a spare front axle and maybe a rear axle, all of which can be strapped to the running board and thus be out of the way. Descending from the bulky articles to the smallest, it is a good thing to be well supplied with cotter pins, which often come in handy. In the tool kit, too, there might be stored away a handful of different sized bolts which can be used often. Wire, too, comes in useful in making temporary repairs, and this should come in different gauges. Of course one should not overlook a small stock of spark plugs and several rolls of tape.

Still continuing the list of useful ar-



It's awkward putting fuel into a tank located on the rear of a roadster when the top is down, but the Great Western puts a slit in the top which gives ready access to the tank

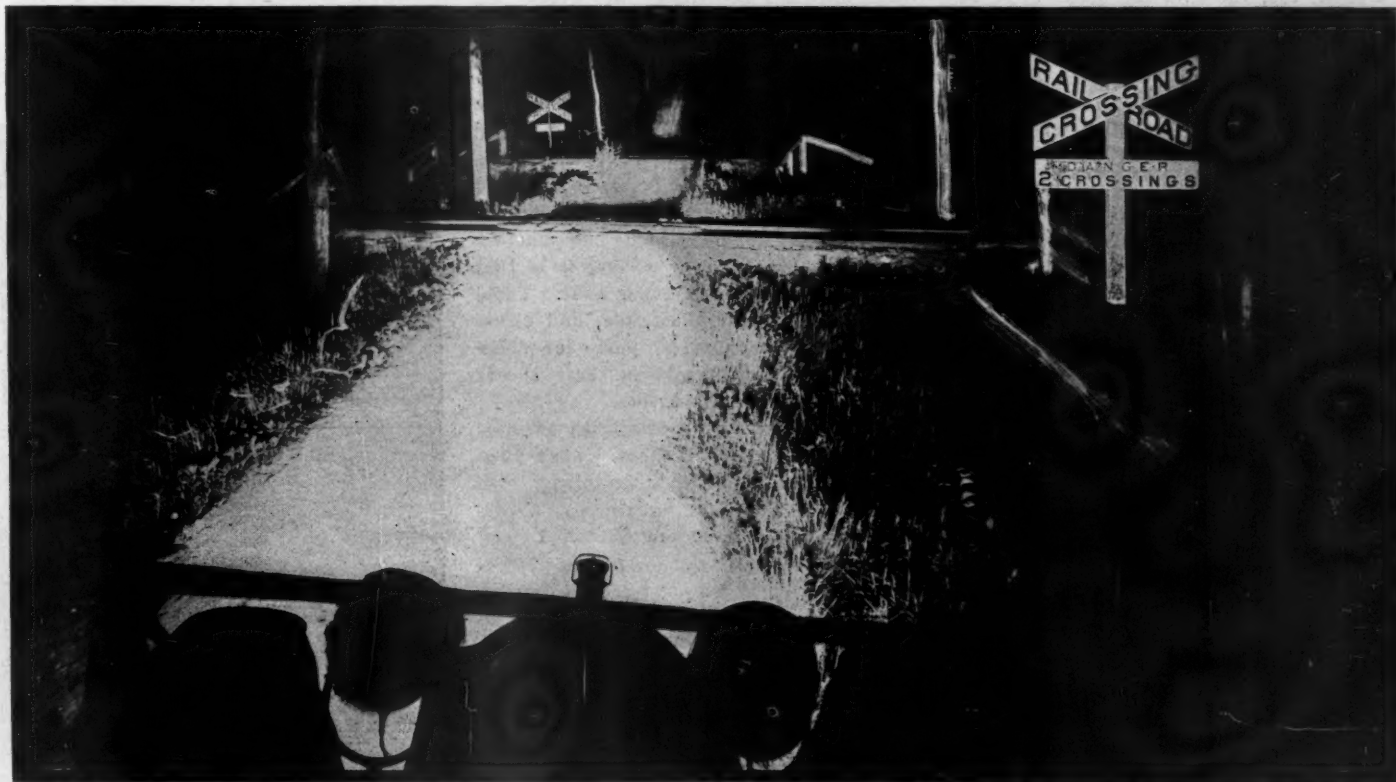
ticles which often are not included in the kit of the tourist, there is nothing handier than a collapsible water bucket, canvas perhaps or rubber, which will save many a step in foraging for water. You are liable to have trouble with your jack or you may have other uses for it, but you should not overlook a piece of scantling, say one 3 feet long and of the 2 by 4-inch variety. A supply of leather straps is not without its uses in the way of strapping on spare casings when tire iron brackets break. Don't forget tire chains.

So much for the extra kit, if it may be called such. Besides these things there are the conventional articles, such as a couple of pairs of pliers, for you are likely to lose one or someone will pocket it without thinking; a couple of monkeywrenches of different sizes; a set of special

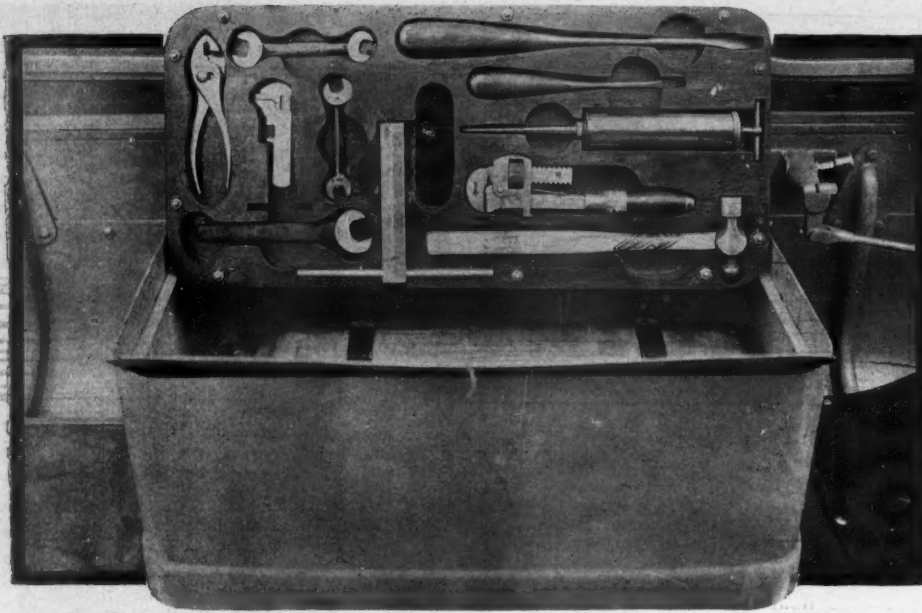
wrenches such as comes with the car and which includes wrenches for removing hub caps, spark plugs, valve caps, and the like. A socket wrench, too, is a handy article, as is a cotter-pin puller, screwdrivers, a hammer or two, a magneto wrench, a gas-tank wrench and one or two others. Then, too, you are likely to be caught where it is useful knowledge to know how to manipulate a soldering iron when, for instance, you have to fix a radiator leak. This outfit of tools may be carried either in a big box on the running board or under the tonneau seat—preferably the former, for then it is not necessary to make the occupants move every time a repair has to be made. Another place for the tool kit is between the battery box and the frame of the car, where the kit can be strapped. By putting the battery under the rear seat one can use the box for other purposes, such as carrying tools and parts. The battery is something that you do not have to have accessible. Provisions for lights at night should be made, either gas tanks or the electric light system, which is coming into popularity.

Look Out for Oil Supply

Having checked up these things, you still have something left to take into consideration. A wise tourist never thinks of going any distance whatsoever without being sure of his oil supply. Oil really is the cheapest thing about a motor car, considering its importance. A few drops properly applied sometimes mean more than a day's work by a clever mechanic. An instance of this was furnished the other day when a Chicago motorist, out



No one even considers touring without making preparations for traveling at night. Powerful lamps light up the road. Nowadays one has the choice of gas or electricity. The illustration shows the rays thrown by electricity by means of the Remy system



A well-kept tool box is one of the comforts of touring. A place for everything and everything in its place is a motto in which the Franklin people have great faith

for a short Sunday run, discovered it was almost impossible to keep the car on the road because of the hard steering. Thinking perhaps it was imagination, he finished the run and then discovered that his grease cups on the steering knuckles had been neglected and that in consequence the interior of the knuckles had rusted so that it was hard to turn the wheel. A dozen drops of oil made all the difference in the world. One should take along at least a gallon of oil in a can that can be carried on the running board, where it will not spill, as it is likely to do if carried in the tonneau.

Then, too, there is the packing of the luggage to be considered in preparing for a tour. Some of the careless ones or the unthinking ones are content to dump the luggage into the tonneau in an indiscriminate manner—hard to get at when wanted and generally uncomfortable for the passengers. A student of the proposition will go about it differently. Some of course depend entirely upon trunks carried on a rack at the back of the car, but often, if the party is a large one, there isn't room enough there and the tonneau has to be invaded.

A Right Way and a Wrong Way

In that event there is a right way and a wrong way of packing. The experienced one, though, will stand the suit cases on end across the tonneau of the car and with the bottoms backing up to the back of the front seats. Then he will fasten these suit cases by means of a special strap which will run through the handles of the suit cases and then pass through cleats on the back of the seats. Between the suit cases and the back and hanging on the robe rails should be the outer garments of the passengers, for this will get them out of the way and at the same time serve as a buffer for the suit cases, preventing the scratching of paint.

The suit cases and the outer garments are not the only things to think of. One has other articles to dispose of—goggles, gloves, veils and the like. The designer of the car, though, has provided for these by fitting pockets to the doors of the cars in which may be stowed away such articles and which can be reached easily.

It is a different proposition preparing for a long trip similar to the one the Premierites now are making. A trans-continental journey should be tackled only after careful preparation. The equipment, too, is somewhat different and more varied than for the ordinary tour. One should see that the tool kit contains extra bolts and nuts, wire, cord, rivets, sheet metal, spring leaves, a breast drill, a blow torch, rope, and a double-sheave pulley, while useful articles are a compass, field glasses, gradometer and camera. The tire equipment should include tires of at least 4 inches in diameter and plenty of spare tubes, for in traveling through a hot climate a puncture means a new tube, for seldom it is that patches will stand up under heat. There should be a repair outfit, too, and either an air bottle or an engine pump for pumping tires. As a precaution there should be two foot pumps carried.

Water is just as important as gasoline in a desert journey and extra cans filled with water should be taken along. Oil aplenty also should be aboard and if possible dry cells should not be relied upon for ignition purposes. Another useful thing is a piece of canvas or a gunny sack, which will come in handy for obtaining traction in muddy or sandy places.

Makers Furnish Conveniences

It is noticeable this year that the manufacturers have given the tourists great consideration in the planning of the new models, and one finds many little comforts provided in the way of stock equip-

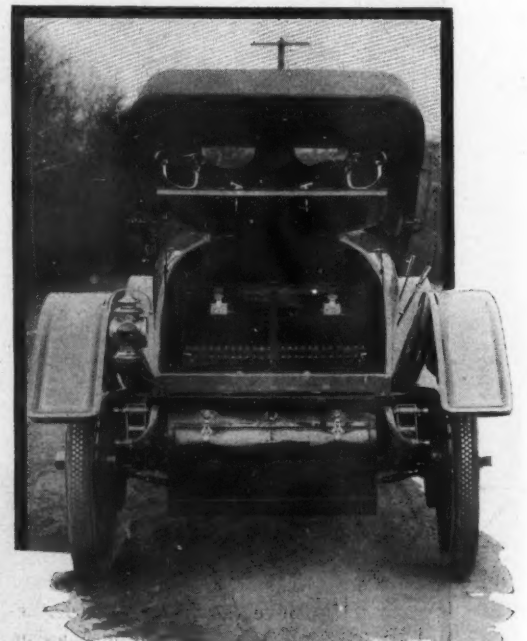
ment. For instance, the Columbia people have provided something unusual in the way of baggage-carrying facilities on their roadster. Room for the trunk is provided in the after deck, where it is completely enclosed and free from contact with dust and mud. Access to this trunk compartment is by means of a rear door, upon which is carried the demountable rims. These extra tires being fastened to the door, it is not necessary to remove them in order to reach the trunk. The running boards on all Columbias are enclosed with sheet metal work which extends outward from the top of the frame member to the line of the inner edge of the running board, which it drops to meet. In this space is built the auxiliary ignition and lighting battery compartments, the tool box and the gas tanks, while in the rear is a metal hamper for carrying heavy tools—jacks, pumps and tubes.

Another Columbia idea that tourists appreciate is the scheme for the carrying of the top side curtains. A tray, somewhat similar to a truck tray, is placed beneath the rear seat, carries these side curtains and prevents the cracking of the celluloid lighting-inserts, which often happens when the curtains are rolled up and stuck under the rear seat.

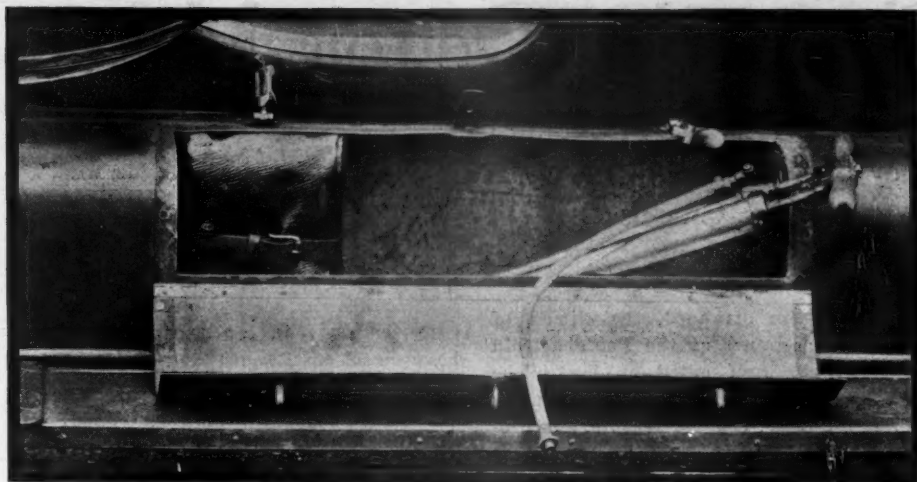
Lock for Gasoline Tank

The Franklin has a gasoline lock which can be used advantageously by tourists who desire to guard their cars against use by others. This lock is placed on the right hand sill of the car beneath the front seat.

Another clever little idea, not much in itself but one which saves some work, is the idea of the Great Western and which is fitted to its torpedo roadsters. Back of the driver's seat is a 20-gallon gasoline tank which has to be filled from the top. Instead of using a small filler plug



Baggage-carrying facilities are demanded by tourists which has resulted in the Columbia people equipping their roadster in a novel manner



Even the running boards are utilized for baggage-carrying space and on the Columbia there is a compartment in which heavier articles like pumps and jacks may be carried.

a large brass cap is used. This permits of the tank being filled with the top down, for there is a slit in the back of the top which affords ready access to the gasoline tank.

The Lozier has a device which does away with the necessity of an extra pipe and extra reserve gasoline tank or valves as well as having to carry extra gasoline in cans on the running board. In the Lozier the gasoline is supplied from a 30-gallon tank which is suspended in the rear portion of the chassis and driven to the carbureter under automatically-supplied air pressure at about 2 pounds to the square inch. The air space in the tank above the gasoline forces the fluid up through a standpipe and delivers it through a pipe line to the carbureter. The lower end of the gasoline standpipe in the tank is about 2 inches above the bottom of the tank and therefore when approximately 25 gallons of gasoline have been forced out of the tank the supply pipe no longer will carry gasoline to the carbureter, leaving about 5 gallons in the bottom of the tank.

Reserve Supply Available

In this manner a careless driver who discovers that his supply of fuel is apparently exhausted merely has to remove the standpipe by means of a union and insert a spare one which extends to within a quarter of an inch of the bottom of the tank, enabling him to use up the 5 gallons that have been held in reserve.

Another Lozier touring idea is a removable compartment under the front seat. Instead of lockers built independently in that part of the car, these lockers are built in the form of a trunk with handles. This trunk can be slid backward into the tonneau or removed entirely. Besides making it easy to get into these lockers, the driver often finds it handy to remove the trunk when he desires to get at some part of the mechanism that is located under the front seats.

Considerable thought has been given to the comfort of tourists by the Rambler manufacturers and noticeable on this year's

crop of Ramblers is the fact that the top curtains are carried in a pocket just in back of the front seats where they can be reached without disturbing the passengers in the tonneau. These top curtains are fastened inside instead of outside of the bows of the top and in case of rain, instead of getting out and standing in the rain while the curtains are being adjusted, it can be done from inside the car. Another claimed advantage for this method is that when driving fast or on a windy day the curtains do not belly out as they sometimes do when fastened outside the bows.

Storage Room in the Rear

On the Moon it is noticeable that the roadster-body back of the rear seat is entirely closed and contains a 25-gallon gasoline tank and two compartments, the lower one being for carrying two extra tires and the upper compartment for baggage. The body is the full width of the frame at the rear, with slightly rounded corners, and increases in width forward to the seats and tapers from the seats to the dash.

One often finds, however, that the makers have not provided for everything and that often expedients have to be adopted that work out well. An instance of this is related by W. H. Van Dervoort, president of the Moline company, who tells of an incident that occurred while he was touring with his brother Neal, winner of the Chicago trophy in the last

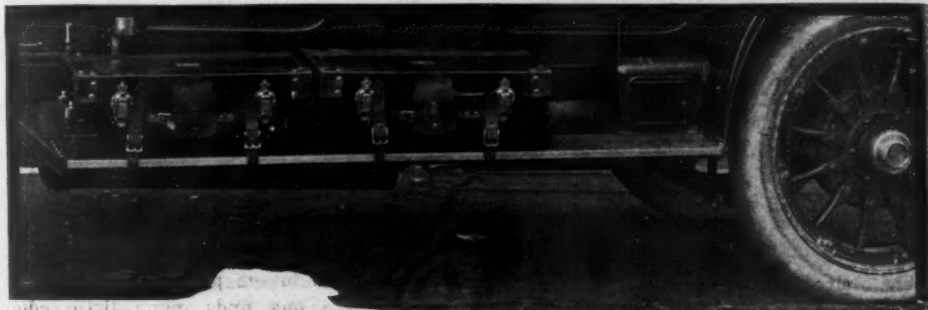
Glidden. The president of the company was driving one car and his brother the other and night overtook them. Then it was discovered that the gas tank on W. H. Van Dervoort's car was empty. Neal had a full tank, though, so he suggested that they try to transfer some of the gas in his tank to the empty one. So Neal ran his car close to the other one and W. H. Van Dervoort dug into his tool box and found a short length of gas hose, with which he made a connection between the two tanks. Letting the gas in gradually so as not to blow off the rubber connection, enough gas was transferred so the two brothers were able to complete their journey without mishap.

Starting a Cold Motor

Another pointer given by the Moline men should be valuable to tourists traveling in cold climates. Mr. Van Dervoort has used acetylene gas for facilitating starting a cold motor and now he is prepared to use it at any time he desires because of an idea he has worked out. In his line from the gas tank he has installed a bypass so that by opening one cock and closing another he can bypass the gas that ordinarily would go to the headlights to a point in the intake manifold about half way between the carbureter and the cylinder or just below the divide in the pipe. In starting the motor he opens the needle valve about two full turns, flushes the carbureter so as to get an adequate supply of gasoline for the first few explosions, opens the gas tank about as much as he would for ordinary gas lighting and then cranks the motor. It invariably catches on the first or second revolution, after which the spark is advanced, the gas shut off and the gasoline throttled down to its normal position as soon as the motor has warmed up.

Heating the Motor

Another idea he has for cold weather starting is to place a small electric heater under the hood just back of the radiator, while the car is in the garage, getting his electricity from the city current. The terminals are just outside the hood. About half an hour before he wants to take his car from the garage he turns on the city current, keeps the hood and radiator carefully covered and in this manner warms up the motor so that he generally has little difficulty in starting.



All trunks are not carried in the rear of the tonneau. The Locomobile finds room for two commodious trunks on the running-board.

New Trend Shown by Detroit Makers

Announcement of Added Models by Chalmers, Regal and Abbott Demonstrates Tendency of Michigan Manufacturers To Get Away From One-Chassis Idea and Hold Agents in Line

DETROIT, Mich., July 10—The present month has been featured by a considerable number of factory announcements of 1912 lines, among the most recent of which are those of the Chalmers, Regal and Abbott-Detroit. In all these cases it is a notable fact that the makers have gotten farther and farther away from the old system of building but one chassis, which is equipped with a body variety as great as possible.

The Chalmers company will produce three chassis types—the 30, 40 and a new one of 36 horsepower. The Regal company will continue its 30 and 40 as well as its underslung 20 roadster. It adds, however, an underslung 35 with a five-passenger body. The Abbott company has supplemented its 30 with a model 44 seven-passenger type with a long-stroke motor, $4\frac{1}{2} \times 5\frac{1}{2}$. Another company that is enlarging its line for 1912 is the Brush, which is adding the Liberty-Brush—a simpler type than the regular single-cylinder model.

The increased diversity in models is becoming a remarkable feature, as, in addition to those mentioned, the Metzger Motor Car Co. and the Packard have both announced 1912 sixes in addition to their regular line. In fact, of the larger Detroit factories, the Ford, Warren and Cadillac are now about the only ones locally which still stick to one chassis type. None of these companies has made a 1912 announcement as yet. The E-M-F company branch of the Studebaker corporation really deserves ranking as a fourth in this group, as its two chassis types are put out at separate plants and by separate manufacturing organizations.

To a great extent this trend is undoubtedly due to the fact that the purchasing public has become more discriminating and supply is now equal to demand. Rapidity of manufacture was at one time the main road to success. Now the most difficult feature is the organization and solidification of a staff of dealers. To retain these dealers, manufacturers have obviously decided to give them a broader scope. Many of the factories obviously are endeavoring to equip their dealers with lines which will make it unnecessary for them to handle cars made by any other manufacturer, in order to make an appeal to a wide variety of wants of purchasers.

Ford's Summer Convention

One of the events of the past few days was the annual summer convention of the Ford branch managers. An elaborate pro-

gram had been arranged, the climax of which was a dinner at the Pontchartrain at which the firm acted as host. The menu was of the most elaborate character and, at the close, a novel feature was provided in the display of a set of moving pictures, depicting the recent ascent of Ben Nevis by a model T Ford. The picture machine followed the car to the top and the branch managers had the unusual opportunity of witnessing what must have been a most stirring feat. P. L. D. Perry, the manager of the firm's London branch, was in attendance. It was under his management that the feat was performed.

During the week the branch managers were daily at the factory, addresses by department heads and well known members of the Ford organization being combined with a thorough inspection of the enormous plant.

The Detroit-Cleveland route is being used frequently these days for the demonstration of the road qualities of Detroit-made motor trucks and wagons. The trip was made first by a VanDyke, carrying a ton of luggage, belonging to the affiliation tourists. The new Detroit motor wagon covered it last week. The latest car to be sent over the course is a 5-ton truck of the Alden Sampson company, which is being delivered to a Cleveland milling concern. This is by far the largest vehicle to make the trip, which it completed in safety, on remarkably rapid running time.

Inspecting Rapid Plant

President Thomas Neal and a party of General Motors notables have been giving especial attention of late to the big plant of the Rapid Motor Vehicle Co. A number of visits have been made to Pontiac and a systematization of the firm's selling and manufacturing operations has been the result. The Rapid factory is one of the best equipped in the country for its purpose, now represents an investment of \$2,000,000 and is working at full capacity, according to Sales Manager T. P. Myers, producing trucks of 1 and 2 tons capacity.

A General Motors appointment is that of L. W. Place as assistant to the general manager of the Oldsmobile plant. Mr. Place has been with the firm for several years but has spent most of his time on the road, as branch manager and otherwise in the employ of the sales department. He will make his headquarters in Boston for a time.

Two remarkable tours have just ended in Detroit. Both were made by cars in

the hands of owners. F. H. Bachman, of San Antonio, has arrived after the trip from his home, which he made with his wife in a Brush runabout. Mr. Bachman is a pottery salesman and combined business with pleasure on his trip. A. E. Jewell and family are back from a trip of 6,500 miles in their Buick. They have been on the road for nearly a year and have been east, south and west, having traveled twenty-nine states, the most remote of which was Florida. Stops of varying length were made at different points. The 6,500 miles is all road mileage, the car traveling also in the neighborhood of 4,000 miles in local trips.

The Foster Motor Sales Co. is erecting a new garage at 1751 Woodward avenue, which will be used as the local headquarters of the Thomas. The building will be 45 by 175 feet in area, of glass and metal, with an especially attractive show room. The new company is capitalized at \$17,500. Another new garage is being built for the local branch of the Cartercar Co., which has been crowded out of its present quarters.

Abbott Stockholders Meet

A meeting of the stockholders of the Abbott Motor Co. was held at the offices of the company, Waterloo and Beaufait streets, on Friday. The stockholders discussed the increase in business done during the current year, and authorized an increase in the capital stock of the company from \$300,000 to \$1,000,000. Over \$500,000 in cash was subscribed on the new stock issue, all of which was taken at par.

The greater portion of the stock subscribed was taken by the syndicate of eastern capitalists who own the controlling interest in the Abbott company, comprising C. W. Jamieson, president of the company; Senator F. M. Knapp, first vice-president; H. M. Preston, second vice-president, all of Warren, Pa., and W. S. Hoskins, of Weston, W. Va., while a number of the local stockholders have increased their holdings in the company. Over half of the new issue has been paid in in cash and the balance will be paid in within thirty days from date.

It is not the intention of the company to extend the plant to any extent during the coming year, as the present facilities, together with the equipment in eastern manufacturing plants controlled by the Abbott Motor Co. is ample to take care of an output of 3,000 cars, scheduled for the season of 1912. The company turned out 1,500 cars during 1911.

The board of directors remains the same, as follows: C. W. Jamieson, president; F. M. Knapp, first vice-president; H. M. Preston, second vice-president; W. S. Hoskins; Wade Millis, secretary; M. J. Hammers, treasurer and general manager.

N. A. A. M. Will Hold Show in Palace

NEW YORK, July 10—The most important action of the monthly meeting of the National Association of Automobile Manufacturers, Inc., held on Thursday, July 6, was a decision to conduct a show at the Grand Central palace, New York, opening on January 10 and closing January 17, 1912. This show will be open to all manufacturers, and it is known as the result of extensive correspondence carried on during the past month, that practically all of the manufacturers who do not exhibit at Madison Square garden will take part. It is also practically settled that the Motor and Accessory Manufacturers will take the greater part of the space devoted to that branch of the industry which the association represents.

This show, it will be observed, will run during the last 4 days of the first week and first 3 days of the second week of the garden show. It will embrace both passenger and commercial vehicles, each, of course, in separate departments. This arrangement is made possible by the splendid facilities offered by the new Grand Central palace.

The building is located two blocks farther north than the old palace, is built entirely of stone and marble, except as to the floors, which are laid on concrete and fire-proofed, and affords 126,000 square feet of floor space.

The price of space, including decorations, equipment and charges of every character, will be \$1.25 per square foot. Of the net proceeds of the show, if any, the association will retain one-half. The remainder will be rebated to exhibitors in proportion to the amount of their space rental. The method of allotment will be the same as that at the Chicago show. The executive committee referred all other details to the show committee and the general manager with full authority to proceed.

The Krit Motor Car Co. and Grabowsky Power Wagon Co. were elected to membership.

Favorable action on applications for reinstatement was taken in the cases of Vanderwater & Co., Ltd., Crawford Automobile Co., Warren Motor Car Co. and James Cunningham Son & Co., who took part in an unsanctioned show last winter and were therefore debarred from participation in sanctioned shows.

C. G. Stoddard resigned as the representative of the Dayton Motor Car Co., and Alfred Reeves was elected as representative of that company and to fill the vacancy created on the executive committee.

The membership of Charles E. Duryea was transferred to the Duryea Auto Co., of Saginaw, Mich., and Harry S. Haupt was elected to represent the American Locomotive Co., in place of James Joyce.

Decision Reached To Promote Annual Exhibition in New York from January 10 to 17—Automobile Manufacturers' Association Making Plans for Display in the Same Building

At the first quarterly meeting of the members of the Automobile Board of Trade, since its incorporation, which was held Thursday at its offices, President Clifton announced that the new organization went into operation on July 1, and had taken over the offices of the A. L. A. M.

A meeting of the directors of the new organization was also held, and W. C. Leland, of the Cadillac Motor Car Co., was unanimously elected to fill the vacancy created by the resignation of Thomas Henderson, who has retired from office.

A number of important matters in connection with the new organization, such as patents and the forthcoming show in New York, were discussed.

The executive committee of the Automobile Manufacturers' Association of America, which is composed of makers not identified with the Automobile Board of Trade, held a meeting at its headquarters in the Night and Day Bank building, corner of Fifth avenue and Forty-fourth street, on Friday afternoon, when plans for its annual show, which will be held in the new Grand Central palace during the week of January 1, were discussed.

After the meeting it was announced that arrangements had been concluded with the Aeronautical Manufacturers' Association, setting aside the entire third floor of the Grand Central palace.

At the conclusion of the meeting it was announced that Louis J. Bergdoll, head of the Bergdoll Motor Co., of Philadelphia, had been appointed chairman of the show committee and that the other members of the committee would be appointed later.

THOMAS HENDERSON RETIRES

New York, July 8—Thomas Henderson, of the Winton Motor Carriage Co., who has for many years been prominently identified with the work of the motor trade associations has decided to retire from holding office in trade bodies. He has resigned his position on the executive committee of the Association of Licensed Automobile Manufacturers and will, on the first Wednesday of September retire from the executive committee, of which he has been a member for 10 years. On Thursday evening, twenty-five men in the trade, with whom Mr. Henderson has been prominently identified, held a dinner at the Engineers' Club in New York, in his honor, and presented to him a loving cup and an

address engrossed on vellum and beautifully bound. Those in addition to Mr. Henderson, were: S. T. Davis, Jr., William R. Innis, W. T. White, A. L. Pope, Alfred Reeves, Charles Clifton, W. E. Metzger, S. D. Waldon, George Pope, R. D. Chapin, H. O. Smith, E. E. Bartlett, H. B. Joy, L. H. Kittredge, C. C. Hildebrand, Hugh Chalmers, J. W. Gilson, C. C. Hanch, S. A. Miles, Benjamin Briscoe, M. J. Budlong, R. D. Garden, William Mitchell Lewis, W. C. Leland, Frank Briscoe.

The address was presented by W. E. Metzger, president of the National Association of Automobile Manufacturers, Inc., and the cup by Charles Clifton, president of the Association of Licensed Automobile Manufacturers. Both spoke earnestly and feelingly of the esteem in which Mr. Henderson is held by every one with whom he is acquainted, as did Colonel George Pope and others who followed. Mr. Henderson's response was a masterpiece. Although Mr. Henderson has given up as an office holder in trade organizations, the Winton company announces that he has not severed his connection with that concern.


STEARNS DEALERS MEET

Cleveland, O., July 10—A convention of all Stearns dealers and branch managers was held at the factory at Cleveland, Thursday, Friday and Saturday of last week, and practically every city of size in the country was represented. The convention was attended by men from practically every state, and an immense amount of enthusiasm was displayed in connection with the announcement of the new Stearns-Knight.

Addresses and talks were delivered by President F. B. Stearns, Vice-President Roy F. York, Secretary and Treasurer Edwin McEwen, Chief Engineer James G. Sterling, Production Manager C. E. Hadley, Sales Assistant to the President Rollin H. Williams, and Advertising Manager Henry H. Hower.

Aside from the banquets, luncheons, theater parties, etc., there was a demonstration of the Knight engine; the acceleration test of the Panhard-Knight in England being beaten by the new Stearns-Knight model. In the hands of Louis J. Petre, experimental chief of the Stearns company, the new car was started from a dead standstill on high speed alone and inside of 40 seconds was going at a 49-mile-an-hour clip.

NEW YORK OFFICE
 239 West 39th Street



Published Weekly by
THE CLASS JOURNAL COMPANY
 910 SOUTH MICHIGAN AVENUE CHICAGO

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

SUBSCRIPTION RATES
 United States and Mexico
 \$3.00 per Year
 Other Countries including
 Canada \$5.00

The Survival of the Fittest



HERE is less room for the drone in the motor car industry than there was one year ago; and a year hence there will be less room than there is today. These are testing days in the motor car business. They began over a year ago and the testing temperature has been going up pretty rapidly ever since. The actual test began last July, when many of the makers saw that the supply of cars was going to exceed the demand; these makers saw that the day of distributing cars was over and that henceforth cars had to be sold. This was a very severe jolt to many so-called sales managers and to hundreds of salesmen. Up to that time they had largely been distributing clerks, their main duty being to settle how many cars they had to ship to the different dealers in the different states. They had to be kind of conciliatory creatures in order to appease the agents who made weekly visits to the factories to see if they could not get a few extra cars by express delivery or pick up one or two that some other agent had failed to take. Those were halcyon days. Those were the days when the drone looked as good as the real worker. Those were

the days when it was hard to distinguish between the hollow and the genuine, because neither had to take the temperature test.

SINCE the temperature test began there have been many changes in the selling organizations throughout the country. Not a few head salesmen have fallen from their high and mighty positions and have gone somewhere, nobody seems to know exactly where. They have gone to some frontier place where the selling conflict wages less terrible and where the drones can maintain a front. But this weeding out of the salesmen has not all been confined to the heads, but it has passed through the entire rank and file. There is scarcely a salesroom where the real selling test of the last year has not proven the eliminator. Chief salesmen have dropped out and fresh faces have taken their places. The hot-air salesman, as he is known, has almost passed out of existence, and the argumentative, convincing salesman takes his place. It has been necessary for the salesman to know something about his car; he has discovered that scores of the buyers know twice as much about the car as he does; he has also discovered that it is necessary to know all about the product to sell if you expect to be a leader in your line. If you are content to be just one of the salesmen on the lower rung of the ladder, then it will suffice to know but a spattering on the car. But look out—you may even fall off the bottom rung.

BUT the weeding out process, or the survival of the fittest, is not all linked up with the selling organizations; it has entered the engineering departments. In the days when cars were distributed and not sold, the engineering problems were not given the attention they are today. Efficiency was not the big problem at that time; the leading aim was to manufacture cars. The manufacturer amused himself by thinking of the money coming in, and imagined it would always be so. When the time came that cars had to be sold, there was a demand made on the engineer to get deeper into the finer details of the car and develop it. The age of imitation suddenly passed into history. Previous to that it

was enough to do exactly as the other fellow did without asking the reason why. Now this has changed. Cars have to be sold today and they also have to be built. The engineer is taking the temperature test as well as the salesman. The factory president suddenly came to the conclusion that cars had to be sold, and their selling depended on two things: First, having a good car, and second, having a good sales force. The engineer had to build the good car. Some, in fact many, took the test and made good; others could not stand the pressure and stepped down and out. These are only history now. The motor car industry is now in the real test period; it is no longer a case of just deliver cars, but a problem of making real cars and selling them at the lowest possible price. This means good engineering, good manufacturing methods and good salesmanship. In this three-fold contest only the real ones will exist; the others will sink.

Legitimacy of the Motor Truck



THIS is an ill wind that blows nobody good. This was well demonstrated during the recent hot spell in connection with the motor truck business. In several of the big cities horses were dying in larger numbers every day owing to the heat; at times it was impossible for some of the owners to get fresh horses to take the place of the old ones, and they were forced to look to the motor truck as a solution. More than a score of sales have been reported to brewery and ice people as a direct result of the heat. It is well that there are arguments strong enough to convince even the most skeptical as to the real merits of the truck. It is regrettable, however, that in nearly every case reported in which sales were made during the hot weather, it was the buyer who came to the truck seller, and not the truck seller who got after the buyer. This is a lesson in truck salesmanship: The truck salesman should be a bad weather salesman; he should be doing his best work when conditions are apparently worst and perhaps when it is hardest for him to work. His is not a fine-day, dry-weather, dry-street vocation; rather, he should be most alert when the temperature is over the 100 mark and too high for the poor old horse; he should be specially busy when the streets are too icy in the winter for horse traffic to make any headway; he should be all activity in the late fall when horse traffic is having its troubles with bad weather, sudden changes in temperature, bad streets and other conditions that go against the horse. The truck salesman must anticipate all of these conditions, he must not be a laggard, he must have brains and he must use them. He must study traffic conditions, study the times, the seasons, the conditions and the weathers that are hardest on horse traffic. These constitute the vulnerable points in horsemanship; these are the points at which he must hurl his every energy; he must concentrate on these when conditions arise. It is useless to stand around in the salesroom wondering why the big horse transportation companies do come along to buy trucks; it is folly to write a few semi-convincing letters; the salesman must get on the firing line; when he does this he will see the actual conditions; he will see conditions as the prospective buyer sees them or as nearly so as possible, and when both see matters alike it is almost a certainty that the salesman will make a sale.

Missouri Picking Official State Highway

ST. LOUIS, MO., July 10—Realizing the importance of good roads, Governor Hadley has taken personal charge of a pathfinding trip to decide on a state highway from St. Louis to Kansas City. The governor's party will start from St. Louis in motor cars Monday morning, July 17. There are three proposed routes. One is through the northern part of the state, the second is through the central districts, and the third through the southern part. When the governor and his party have finished their tour over the three routes, one is to be declared the Missouri state highway, and it will be improved immediately. Members of the Automobile Club of St. Louis will conduct the governor and his official party on the trip. Pilots from many cities and towns along the route will meet the pathfinders, and arrangements have been made for many good roads meetings. Curtis Hill, state highway engineer, will accompany the governor and will draw plans for the improvement of the route selected.

HOBSON GOOD ROADS BOOSTER

Washington, D. C., July 8—Representative Hobson has introduced a bill in Congress that is of the utmost interest to the motorists of the country. It provides in effect that an appropriation of \$250,000 be made for the purpose of making a preliminary survey and estimates of cost of construction of a highway from Niagara Falls, N. Y., to New Orleans, La., to traverse the following general route:

Beginning at Niagara Falls, thence by the most practicable route to Zanesville, O., then through Maysville, and Lexington, Ky., Nashville and Columbia, Tenn., to Florence, Ala., over the route of the proposed national highway from Zanesville to Florence, advocated by Henry Clay in congress, and thence through Columbus, Miss., to New Orleans over the route followed by Andrew Jackson and his army on their march from the battle of New Or-



July 4-20—Prince Henry tour, Germany.
 July 14—Reliability run for trucks of Quaker City Motor Club, Philadelphia.
 July 15—Guttenberg track race, Henry Shaffer, promoter.
 July 15-17—St. Louis reliability run, Missouri Automobile Association.
 July 17-22—Milwaukee reliability run, Wisconsin State Automobile Association.
 July 17-19—Cleveland reliability run, Cleveland News, Cleveland, O.
 July 20-28—Minneapolis reliability run to Helena, Mont., Minnesota State Automobile Association.
 July 23—French grand prix road races.
 August 4-5—Brighton Beach 24-hour race, E. A. Moross, promoter.
 August 3-4-5—Galveston Beach races, Galveston Automobile Club.
 August 7—Reliability for trucks, Chicago Evening American.
 August 10-12-13—Races on Gearhart beach, Portland Automobile Club, Portland, Ore.
 August 12—Worcester hill-climb, Worcester Auto Club.
 August 12—Reliability run of Quaker City Motor Club, Philadelphia.
 August 17—St. Louis reliability run, Missouri Automobile Association.
 August 25-26—Elgin road races, Chicago Motor Club.
 September —Glidden reciprocity run.
 September 1—Oklahoma reliability run, Daily Oklahoman.
 September 2-4—Brighton Beach races, New York.
 September 4—Denver track meet, Denver Motor Club.
 September 7-8—Philadelphia track meet, Philadelphia Automobile Trade Association.
 September 7-8-9—Track meet, Minnesota State Automobile Association, Hamline track, Minnesota.
 September 7-10—Reliability run of Buffalo Automobile Club.
 September 12-13—Track meet, State Automobile Association, Grand Rapids, Mich.
 September 15—Track meet, Appalachian exposition, Knoxville, Tenn.
 September 16—Track meet, Automobile Club and Dealers, Syracuse, N. Y.
 September 18-20—Reliability run for trucks of Chicago Motor Club, Chicago.
 September 23—Road race, Lowell, Mass., Lowell Automobile Club.
 October 3-7—Track meet, Danbury, Conn., Agricultural Society.
 October 7—Fairmount Park road race, Philadelphia.
 October 9-13—1,000-mile reliability, Chicago Motor Club.
 October 16-18—Reliability run of Harrisburg Motor Club.
 November 1—Track meet of Waco Automobile Club, Waco, Tex.

*Sanction Granted

leans in 1815, and to be known as the Clay-Jackson memorial highway, in commemoration of the patriotic services of Clay and Jackson.

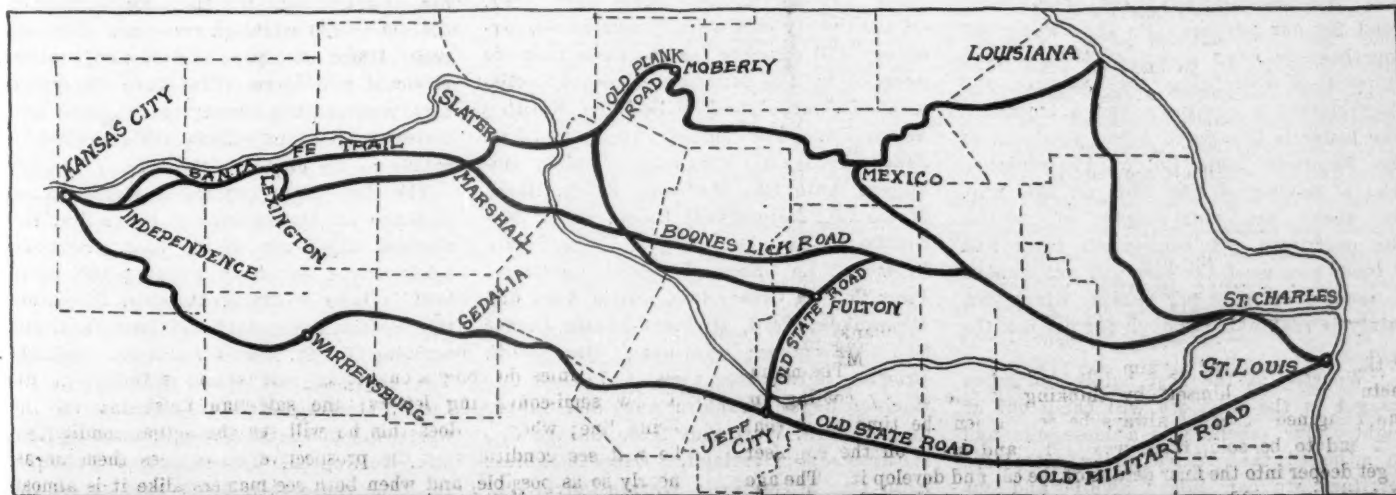
The proposed survey is to be made under the direction of the office of public roads, department of agriculture.

BLAZING NEBRASKA'S TRAIL

Omaha, Neb., July 8—The Inter-State pathfinding car for the World-Herald endurance run, under the auspices of the Omaha Motor club, last week went out over the route to arrange for the run. The first day the noon control will be at Columbus, and the night control at Grand Island. The second day the noon control will be at Lexington, and the night control at North Platte. Kearney will be the checking station in the morning, and a brief stop will be made there. Although the contestants probably will come back over the North Platte route on the 4-day run, the pathfinder took a different course on the return, swinging over to Holdrege, and coming in on the South Platte-Omaha-Denver road. Much has been done on this road recently. The run comes early in September, for the \$450 offered as prizes by the World-Herald, and at this time the judges will decide which townships and county on the North Platte route have the best stretch of road. For the best roads \$800 in prizes is offered.

PRINCE HENRY TOUR PROGRESS

London, July 12—Special cablegram—The participants in the annual Prince Henry tour, which is a team match between the Royal Automobile Club of Great Britain and the Imperial Automobile Club of Germany, have been engaged in the struggle just 8 days. They arrived in England Sunday and the next morning drove from Southampton to Leamington, a distance of 145 miles. They went to Harrogate, 148 miles, yesterday, and today they are driving to Newcastle-on-Tyne.



ROUTES GOVERNOR HADLEY OF MISSOURI WILL INSPECT NEXT WEEK

Owners Enjoying Their Long Tour

Premierites, Bound From the Atlantic to Pacific, Stop in Chicago, Then Strike Out to the West—Party Remarkable in That There Isn't a Chauffeur in Any of the Dozen Cars

CHICAGO, July 8—The ocean-to-ocean tourists reached Chicago Thursday afternoon, passed Friday here and this morning they headed west again, intent on making Davenport, Ia., by night. In the party are thirty-eight enthusiastic motorists, eight of whom are women, who are riding in a dozen Premier cars, while accompanying them are a motor truck for carrying the surplus baggage, and a service car. Preceding them and blazing the trail is Ray McNamara, who knows every foot of the road from coast to coast.

In the past there have been motoring caravans galore cross the continent, but this party that now is headed toward the setting sun is most representative of the sport in that it truly represents the amateur spirit. Every car is privately owned and the owner of each is driving it. There isn't a chauffeur in the party—not even a mechanic. Every man and woman is in the tour for the enjoyment to be had out of it and an earnest desire to demonstrate that our American roads are not nearly as bad as they are painted.

"You see, it was this way," explains J. G. Monihan, who is the new advertising manager of the Premier company. "Some of our wealthy owners in and around Philadelphia became tired of ordinary touring. They wanted something different and several of them came to me for suggestions. They aspired to cross the continent and so I mapped out a scheme for them, to which they agreed.

"They believed that the roads of the far west are not as bad as they have been reported. Those who have run from ocean to ocean in the past naturally have emphasized the road conditions in order to add to the glory of making the trip. Now we think that by traveling leisurely that we can make good progress and that we will find the highways out west fairly good for our purpose. So the owners got together—an even dozen of them. Each chipped in something for expenses and they elected a chairman and a treasurer. The latter is George C. Allen, president of the Republic Trust Co. of Philadelphia, who is paying all the bills on this trip. As there are thirty-eight of us in the party we get convention rates and it looks now as if the cost will not amount to more than \$250 per person, which certainly is reasonable enough for a 2 months trip.

"We stop at the best hotels and when we get in the west we will camp out at night. Our schedule is a loose one and so adjusted that if we strike attractive territory we can linger awhile and cut down our stay in the larger cities. We

carry with us letters from governors, while the chief of police of Philadelphia has written ahead to the police in every town through which we pass, telling them to look out for us and to give us every courtesy. So far they have done so and we have had a great time."

CLAIM SOME CUT COURSE

St. Louis, Mo., July 10—Complaint has been made that some of the five touring cars which finished with perfect scores in the July 4 reliability run of the Missouri Automobile Association did not follow the prescribed course, having cut several miles off the route by short cuts. An investigation will be made to determine if there is any truth in the allegation. The contestants made unusually good time over the 34.7 mile course. There were two divisions, one for pleasure cars and the other for trucks. The pleasure-car score was:

Car—	Driver.	Score
Kline	Ashley Gray.....	Perfect
Selden	H. B. Beguelin.....	Perfect
Cadillac	Dan Wandell.....	Perfect
Case	E. L. Colwin.....	Perfect
Mercer	Charles Kean.....	Perfect
Firestone-Columbus.	John Burns.....	991
Regal	Roy Anselm.....	991
Ohio	George Bolz.....	991
Mercer	R. W. Russell.....	989
Regal	976
Palge-Detroit	H. M. Paine.....	949
Ohio	George Mueller.....	*
Halladay	Robert Adams.....	*
Marion	R. W. Pissell.....	*

*Disqualified

The score of the trucks was:

Car—	Driver	Score
Atterbury	J. C. Summers.....	Perfect
Federal	R. Stelgis.....	993
Atterbury	A. Fidler.....	993
Lambert	D. Perrin.....	984
Utility	T. H. Goddard.....	984
Waverley	W. Koch.....	996
Atterbury	A. H. Elliott.....	*

*Disqualified

TWENTY IN BADGER RUN

Milwaukee, Wis., July 12—Twenty cars, at least, will participate in the second annual reliability tour of the Wisconsin State Automobile Association next week. Of the twenty cars already nominated, seventeen will compete for the three trophies donated by the Milwaukee Sentinel, Milwaukee Journal and Milwaukee Evening Wisconsin. The entries are: Cadillac, Jonas Auto Co., Milwaukee; Buick, Hokanson Auto Co., Madison; Buick, Buick Motor Co., Milwaukee; Buick, Buick Motor Co., Milwaukee; Imperial, La Crosse Plow Co., La Crosse; Imperial, La Crosse Plow Co., La Crosse; Reo, Curtis Auto Co., Milwaukee; Ford, Hickman-Lauson-Diener Co., Milwaukee; National, George F. Browne, Milwaukee; Case, J. I. Case Co., Racine; Regal, Franklin Auto and Supply Co.; Auburn, West Side Auto Garage Co., Milwaukee; Overland, Bates-Odenbrett Auto Co., Milwaukee; Warren-Detroit, R. D. Rockstead, Milwaukee; Petrel, Petrel

Motor Car Co., Milwaukee; Krit; Staver-Chicago, Staver Carriage Co., Chicago; Kisselkar, Mortimer I. Stevens, Milwaukee; Franklin, J. D. Babcock, Milwaukee; Marquette-Buick, Bradford Kent, Kenosha.

The entry list in the private owners' division is somewhat of a disappointment, only three cars being entered. Michael S. Sheridan, judge of part 1 of the county court of Milwaukee, has been selected as referee of the tour.

In addition to the twenty contesting cars, there will be a bunch of official cars, namely: Rambler, press; Case, technical committee; Overland, pilot; White gas, assistant pilot; Peerless, pacemaker; Buick, physician.

The start will be from the Hotel Pfister at 7 o'clock Monday morning, July 17, and the finish at the same point Saturday afternoon, July 22.

ANOTHER BLOW AT DIRT TRACKS

Milwaukee, Wis., July 10—In line with the general movement to stop racing on mile horse tracks in the United States, the Wisconsin state board of agriculture has decided to abandon the idea of holding a race meet on the last day of the Wisconsin state fair in Milwaukee on September 16. Milwaukee is especially concerned in the agitation against this class of racing, as Walter Donnelly of the Cino team was killed at the state fair park track on June 22, crashing through the fence on a flat turn. It is probable that the board of agriculture will not again sanction motor racing meets on the track. The idea of holding a motor show in conjunction with the state fair will be carried out as originally planned.

START OF FOUR-STATES TOUR

Indianapolis, Ind., July 12—Promptly at 10 o'clock this morning, Governor Thomas R. Marshall pressed a button, the signal for the start of the Indiana four-states tour. This is a non-competitive run, designed largely as a boosting expedition for Indiana cars.

During the night the cars were parked along University park, to be in readiness for a prompt start on the long journey of 1,431.9 miles through western Indiana, central and northern Illinois and eastern Missouri and Iowa. There are thirty-five cars, representing twenty-two Indiana factories, in the run. They are expected to return to the city on July 22.

The first night control is Paris, Ill., a distance of approximately 102 miles, the shortest day's run of the tour. Between tonight and Saturday evening the route will include Danville, Decatur, Bloomington, Peoria, Springfield and East St. Louis, arriving in St. Louis Saturday evening. The tourists will spend Sunday in St. Louis, starting Monday morning up the west bank of the Mississippi, touching Keokuk, Burlington, Muscatine and Dubuque, Ia. The route then bends east across the northern portion of Illinois to Chicago,

from which place the tourists will return to Indianapolis.

Frank E. Smith, of the Maxwell-Briscoe Motor Co.'s factory at Newcastle, is general chairman of the run, and P. P. Willis, of the Mais Motor Truck Co., is general secretary. H. C. Bradfield is chairman of the press committee. The pilot is a National.

WILLYS HANDLES GARFORD

Toledo, O., July, 10—One of the most interesting announcements is the fact that the entire output of pleasure and commercial cars built by the Garford Co., Elyria, O., will in 1912 be handled by the Willys-Garford Sales Co., incorporated under the laws of Ohio. This selling organization with a capital of \$10,000 has J. N. Willy, owner of the Willys-Overland Co. as president. George W. Bennett, also of the Willys-Overland Co. is vice-president and general manager, and Walter Stewart is secretary and treasurer. The offices will be in Toledo, O. This organization will dispose of the entire output of Garford cars, the present contract being for the term of 1 year. The Garford line includes a six-cylinder car, a four-cylinder and a line of trucks.

It is understood that in the majority of places the Garford car will be sold through the same dealers who handle the Overland product. There are, however, some cities, notably New York, where the present Garford selling organization will be maintained, so that the Garford will be sold in one store and the Overland in another. Throughout the majority of the country, however, it will be handled by the same dealers.

The Overland line will not in any wise interfere with the Garford line and vice-versa, in that one is a much higher priced car than the other. This selling arrangement will give the Overland agents the high-priced car, which will serve as a complement to the Overland line. It is understood that the entire stock in the Willys-Overland Sales Co. is held by J. N. Willys, George W. Bennett and Walter Stewart.

All of the details relative to this new selling arrangement and the Willys-Overland brigade will immediately take control of the Garford sales.

WINDSHIELD CASE SETTLED

South Bend, Ind., July 4—Litigation covering the William type of divided ventilated windshield for motor cars, which has been carried on in the United States patent courts for several years, has ended in favor of M. L. Williams, of South Bend, president of the Twentieth Century Motor Car and Supply Co. A dozen firms claimed this type of shield because it allows the ventilation of the fore-door motor car. The Williams shield is so constructed that the top sash can be moved in either direction, forward for road vision and backward for ventilating the car.

Elgin Racing Circuit Now Being Oiled

Last Stage of Work on Course To Be Used for National Stock Chassis Events Reached—Two Coles in Kane County Cup the Latest Entries Received by the Chicago Motor Club

CHICAGO, July 11—So far as the actual work of repairing the circuit is concerned, the Elgin course over which the national stock chassis road races will be run on August 25-26 is completed. All that remains to be done is to complete the oiling of the course. This was started yesterday and the Elginites expect to be ready for the drivers and cars long before the time specified in the contract with the Chicago Motor Club.

The circuit has been greatly improved over last year, especially the homestretch, which has been widened to 54 feet from Hornbeek's turn to the grandstand. Every one of the four turns has been widened and at Udina the bend is fully 80 feet in width. One grade in the homestretch has been cut down considerably and it now looks as if the circuit would be capable of an average of 70 miles an hour.

Two more entries were received yesterday, the nomination of two Coles for the Kane County cup being received. This makes nine entries in all, eight of them being in the 231-300 class in which now are grouped two Coles, three Falcars and three Staver-Chicagos. In the Elgin National Ralph Mulford in the Lozier is the entry.

STUDYING THE WAR GAME

Chicago, July 10—A unique expedition started out from Chicago last week on an experimental trip of 3,000 miles, when cadets from the Northwestern Military Academy left on an eastern journey in four Cadillacs. The battery consists of the two Cadillac gun carriages which went through the Glidden tour of 1910, experimenting for the government as balloon-destroyers, and two 1911 Cadillacs which are very uniquely equipped for wireless telegraphy. The electricity is developed from the generator run off the engine, and with the aid of a telescopic mast, which runs 65 feet high, messages can be readily sent from 35 to 50 miles. A balloon, which is part of the equipment of each machine, can then be inflated by the making of hydrogen gas, and with this equipment the antennae wires can be carried to any height and the sending and receiving power of the machines greatly increased.

Over the engine hood is mounted a Colt automatic rapid fire gun, firing 480 shots per minute automatically. Alongside of each one is mounted a powerful searchlight, over the front of which is attached a heliographic shutter for visual signaling. Each machine also carries an ax, shovel and a complete set of cooking utensils, tents, blankets and 3 days' rations for the crew. The cars are driven from 30 to

40 miles apart and keep in touch with each other every noon and every night in order to ascertain the value of the wireless equipment under all kinds of weather and road conditions.

A week will be spent at Washington, demonstrating the machines before the army officers, and from that point the party will go through Annapolis to Philadelphia, New York, West Point, Albany, Buffalo and back to Chicago. The trip is one out of the ordinary.

UNCLE SAM WILL CO-OPERATE

New York, July 8—The interest of the United States government in everything relating to highway improvement will be shown in a unique manner, when within the next fortnight the office of public roads will co-operate with the Touring Club of America in a practical road inspection tour. This will be the first time in the history of motoring in this country in which a motoring organization will have the active aid of the government in effective work for road improvement. This tour will start from Washington with Richmond as the objective point, the trip being made by one of the Touring club's official cars.

The United States office of public roads will be represented by Assistant Director Paul D. Sargent, formerly state highway commissioner of Maine; P. St. Julian Wilson, state highway commissioner of Virginia; J. E. Pennybacker, secretary American Association for Highway Improvement; Henry McNair, editor of the Official Automobile Blue Book, and F. H. Elliott, secretary of the Touring Club of America. The main object of the trip is to study highway conditions between Washington and the capitol of Virginia.

TACOMA'S FLORAL PARADE

Tacoma, Wash., July 6—More than 100 motor cars smothered in flowers and greenery as to seem more like rolling arbors than machines—driven by gasoline, electricity and steam, and two bands carried by large motor trucks, adding the charm of music to the delight of the spectacle, united to make brilliant the floral-motor parade in Tacoma on July 3, one of the big events of Tacoma's carnivals of nations. Of the entire number of decorated cars, that of George B. Kandle was awarded the decision of the crowds that witnessed the parade as well as that of the official decision of the judges. Mr. Kandle not only carried off the first prize of \$50 but also the cup given by the Packard company and the Pacific Car Co.'s cup.

Oklahoma City Sets a Good Example

Construction of 28-Mile Boulevard System Designed for Use of Motorists a Lesson in What Can Be Accomplished by Perseverance of Enthusiasts Who Make Roads a Hobby

OKLAHOMA CITY, Ok., July 8—Nearing completion, a speedway 28 miles in length encircles Oklahoma City, runs through the woods where Indians ambushed in the early days and traverses the prairie where the buffalo roamed and the coyote dug his hole unscared.

A city 22 years of age, during the first 19 of which the matter of boulevards and parks was all but neglected, now boasts of a boulevard the right of way of which is valued at more than a million dollars. It connects and passes through a chain of parks that are worth another million dollars, the acquisition of which borders on the picturesque, the romantic and the dramatic.

Ten years ago Everett I. Leach, alderman of the Fifth ward, stood upon the council floor and pleaded for an appropriation of \$50 to improve a 1-acre tract of ground that had been donated to the city for a park. A heartless city council refused to make an appropriation for any such purpose. Two weeks later, at the next regular meeting of the city council, the same intrepid, determined Leach demanded that the city council make an appropriation of \$25 to clear that same acre tract of rubbish, tin cans and filth. Leach lived in the ward that contained that small, rough tract, and he knew what it would mean to a city to plan for boulevards and parks. Fearlessly he fought the city council, and again demanded the small allotment, representing to the council that the little single acre of ground was a menace to the health of the little children of the Fifth ward. The city council begrudgingly appropriated the sum of \$25 to clear the park, the allotment being made for sanitary reasons. At that moment Oklahoma City's \$2,000,000 boulevard system was born, and today the same Leach rides over Grand boulevard, the 28-mile speedway, using at different times of the week any one of his three motor cars.

Looks Into the Future

No one man is responsible for the splendid boulevard system that now makes Oklahoma City the show place of the southwest. Leach saw in the early days, when Oklahoma City had about 10,000 inhabitants, that the day would come when public avenues and parks would be of tremendous value to the people. He obtained the first appropriation, and while it was so insignificant as to be practically overlooked at the time, in retrospect, with 70,000 people daily getting the benefits of



CULVERT IN THE SPEEDWAY

the public improvements, that pitiful appropriation of \$25 was the foundation for the boulevards and the parks which are now fully appreciated by our people.

Until 1908 no great public improvements along these lines had been undertaken. Captain Daniel F. Stiles, J. B. Wheeler and other citizens had made donations of small tracts of land, enough to whet the appetite of the people for outdoor life and, what is more important, had made it imperative to provide a place where motorists could get out on a straightaway course and move some.

In history a crisis usually develops a man of the hour. History did not go wrong at this time, so far as local matters were concerned. There appeared upon the scene a character unique, original and peculiar, the man for the hour, the man for the place, the man with ideas so big that his fellow citizens were amazed. This man was Bill Clark.

Southwest's Metropolis, Only 22 Years Old, Has Shown It Is Abreast of the Times by Its Work in Improving Its Highways—New Road Now One of City's Assets

William H. Clark had been a citizen of Oklahoma City for many years, being a pioneer. Quietly, he had prospered. Of a retiring disposition, he kept out of public life. But a people had elected a new mayor, and this new mayor was familiar with the fact that the quiet Clark knew more about the trees, the grass, the flowers, the shrubbery and the laying out of great avenues than most of the rest of the population put together. So the mayor appointed Will Clark to be park commissioner, and the appointment was forgotten in about 24 hours, for Oklahoma City had few boulevards and its people were more interested in making money than they were in building avenues and speedways.

Paving the Way

About the first thing that Park Commissioner Clark did was to look over the field and feel of the situation. Former park commissioners had not taken their offices very seriously, although, to their credit, it must be said that they wisely spent all the funds that the people would permit. But conditions were not yet ripe to spend great blocks of money for boulevards.

Clark had plenty of time to consider the matter carefully. It being unnecessary for him to worry about an income, as he owned several business blocks, he spent his time planning. He was after big game and he wanted to work out his plans



SOUTHWEST PARK BEFORE SPEEDWAY CUT THROUGH IT

before he should startle the people with a boulevard system plan.

For weeks this park commissioner tramped over the ground that surrounds Oklahoma City, walking over rough ground where he had hunted wild game before the suburbs of the fast growing city had commenced to stretch out into the country. How many miles Clark walked in that preliminary eye-survey is unknown, but within 3 months from the time that he had been appointed park commissioner Will H. Clark walked into the council chamber and astonished the aldermen by asking that an election be called to vote on the proposition to issue \$400,000 of bonds to build a boulevard around Oklahoma City, and to be 28 miles long.

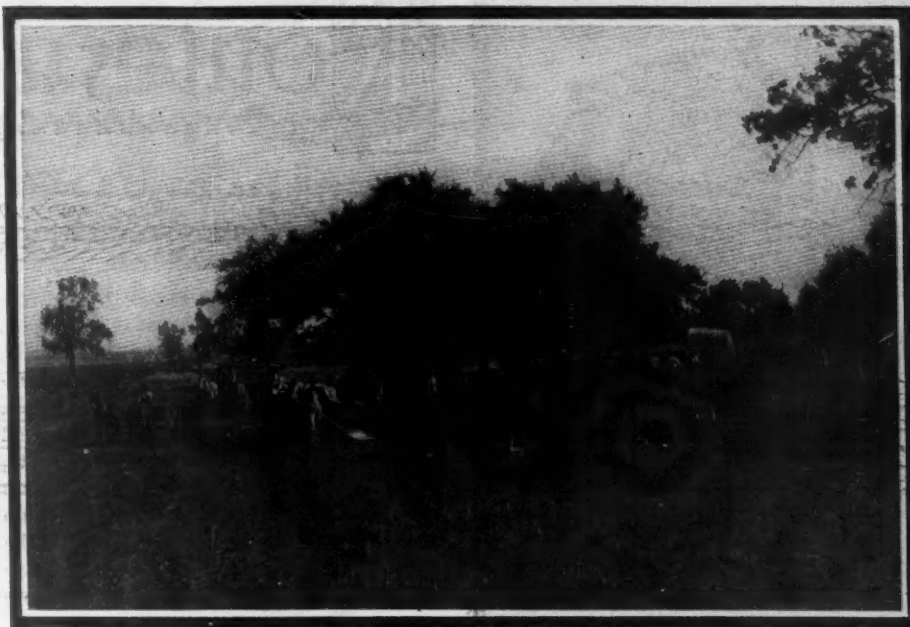
The members of the council were dazed. Citizens of Oklahoma City threw up their hands in horror, taxpayers let out the time-honored yell about the high taxes, and Oklahoma City in general was puzzled. What! Spend almost half a million dollars to build a speedway at the expense of all the taxpayers just for the benefit of 1,100 motorists! But—Clark told them we would also build some parks, and every person, every child would get benefits from the outlay that was contemplated.

People See the Light

The people had reached that stage of civic ideas that they needed little urging after they became familiar with the plans. The \$400,000 bond issue went through with a whoop and the Grand boulevard was about to become a reality. Clark had quietly obtained options on the land which would be needed, and upon the ratification of the large bond issue he was ready to do business.

The one room that had been the headquarters of the park board was abandoned and extensive quarters were fitted up in the city hall, engineers were employed, draughtsmen were put to work, and the scene of activity began which still exists and will continue for years, for the park board engaged in financiering while they were planning to build avenues and lay out boulevards.

Did the park board buy land sufficient



A PARK ON GRAND BOULEVARD, OKLAHOMA CITY'S SPEEDWAY

for the Grand boulevard and the parks along that boulevard, and no more? Not much. They also bought a few farms adjoining the parks and boulevards, knowing that such adjoining land would make tremendous increases in value when the boulevard was built. The excess land was acquired for the express purpose of making more money for the improvement of the boulevard system. When the \$400,000 shall have been expended then the excess land can be sold and the proceeds used by the board. The money derived from the sale of this land cannot be used for any other purpose. That is where the wise Clark got in his work for the benefit of the people and makes a perpetual fund for further improvements.

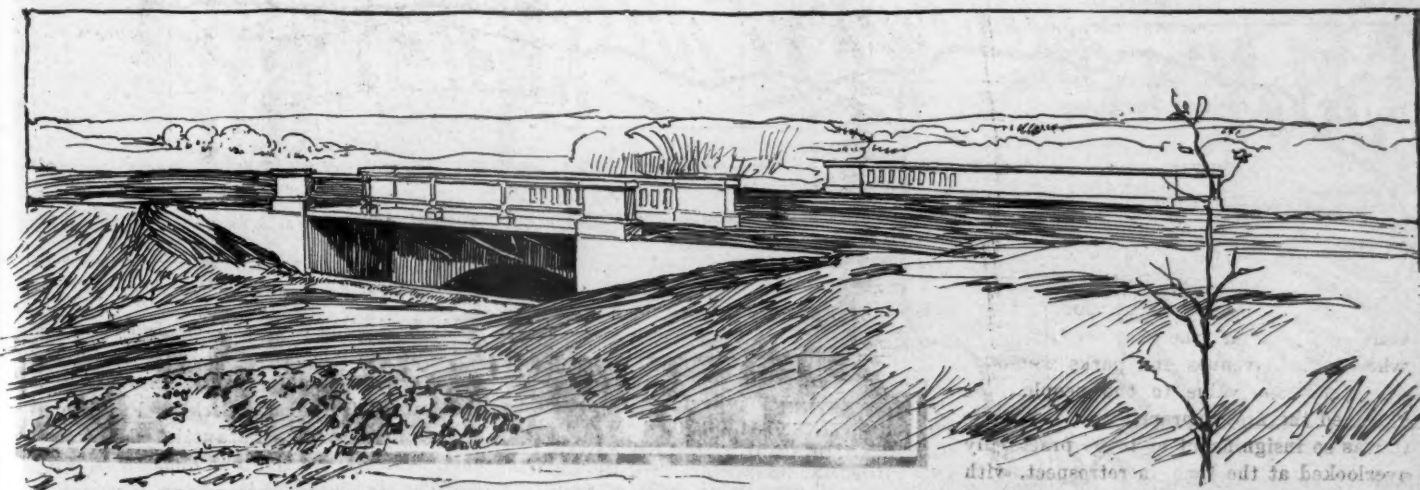
Now Property is Valuable

Rich men are clamoring to buy acre tracts along the boulevard that they may erect splendid mansions. They now see that along Grand boulevard is to be the most beautiful residence section near Oklahoma City. But the far-seeing Clark saw it first, and will not listen to requests of purchasers at this time. The land is

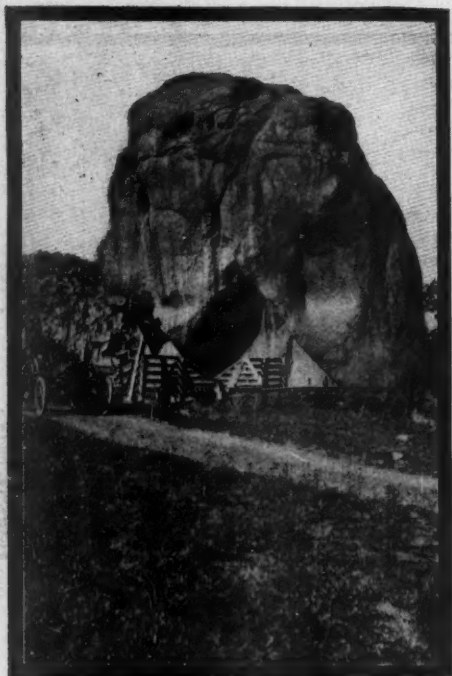
growing in value. There are 500 acres than can be platted when the time comes to need more money. No one dares estimate the value of this land.

So, as the bonds mature, the land will be sold to extinguish the bonds, and Oklahoma City will have a boulevard surrounding the city, with many fine parks as a part of the system, and the investment is not going to cost the taxpayers a cent.

Grand boulevard is 200 feet wide through most of its course. There are twenty-seven concrete culverts and bridges in the 28 miles, and the entire distance is unobstructed. A few days ago R. E. Brownell, the chief engineer of the park board, made a run through part of the course, at a speed of 60 miles an hour, to test the speeding qualities of the part of the speedway that has been treated to make a smooth surface. Calcium chloride was used and has proven a success in the red clay of the roadway. Large quantities of this same substance will be purchased to complete the 28 miles and make the speedway the fastest in the southwest, if not in America.



CONCRETE BRIDGE AND SPILLWAY ON GRAND BOULEVARD, CARRYING OVERFLOW FROM LAKE UNDER SPEEDWAY



ELEPHANT ROCK NEAR BUENA VISTA,
COLO.

CHICAGO TO WICHITA

WICHITA, Kans.—Editor Motor Age—Through the Routes and Touring Information department will Motor Age kindly publish a route from Chicago to Wichita, Kans., and also advise the distance?—C. W. Cummings.

From Chicago to Davenport, Ia., 173 miles, the Blue Book route is through Lombard, West Chicago, Geneva, DeKalb, Creston, Rochelle Ashton, Dixon, Sterling, Galt, Lydon, Hillsdale, East Moline, Moline, Davenport. The Davenport-Des Moines division of this route, 187 miles, passes through Durant, West Liberty, Iowa City, Tiffin, Homestead, South Amana, Marengo, Ladora, Victor, Grinnell, Newton, Colfax, Des Moines.

At Des Moines you have the choice of two routes to Kansas City: The first via Council Bluffs, 406 miles, through Wauke,

Routes and Touring

Motor Trips Over the Transcontinental Route

Adel, Guthrie Center, Exira, Lorah, Atlantic, Walnut, Avoca, Minden, Council Bluffs, Glenwood, Randolph, Shenandoah, Tarkio, Burlington, Wilcox, Maryville, Savannah, St. Joseph, Atchison, Lowemont, Leavenworth, Wallula, Kansas City, and the second via the Mount Ayr line route, which is a short-cut between Des Moines and St. Joseph, Mo., as shown in the map on page 23 of Motor Age for July 6. The towns on this Ayr line, as it is called, are Boonville, Winterset, Macksburgh, Afton, Arispie, Tingley, Mount Ayr, Delphos, Redding, Irena, Grant City, Worth, Gentry, Stanberry, Rochester, Saint Joseph; thence as outlined in the Omaha section above.

From Kansas City, follow the 1909 Glidden tour route which passed through the towns of Shawnee, De Soto, Eudora, Lawrence, Topeka, Silver Lake, Rossville, Bellevue, Wabaussee, Manhattan, Ogden, Junction City, Detroit and Solomon. Then go south through McPherson and Newton to Salina. An alternate route from Kansas City by the way of Emporia is as follows: Kansas City, Shawnee, Olathe, Gardner, Edgerton, Wellsville, Ottawa, Home-wood, Williamsburgh, Agricola, Waverly, Neosho Rapids, Emporia, Saffordville, Elinor, Cottonwood Falls, Elmdale, Florence, Peabody, Wichita. Distance approximately 237 miles.

INDIANA-WYOMING ROUTE

Hammond, Ind.—I would like a route from Hammond, Ind., to Cheyenne, Wyo., also a map diagram if possible.—C. Humboldt.

From Hammond go through South Chicago to Chicago. From Chicago to Cheyenne follow the route outlined in the transcontinental route on page 15 of this issue. The towns passed through are: Chicago to Clinton, Ia., 147.6 miles; Chicago, Lombard, Geneva, DeKalb, Creston, Rochelle, Ashton, Dixon, Sterling, Morrison, Clinton.

Clinton to Cedar Rapids, 90 miles; Clinton, DeWitt, Grand Mount, Wheatland, Lowden, Clarence, Mechanicsville, Lisbon, Mount Vernon, Marion, Cedar Rapids.

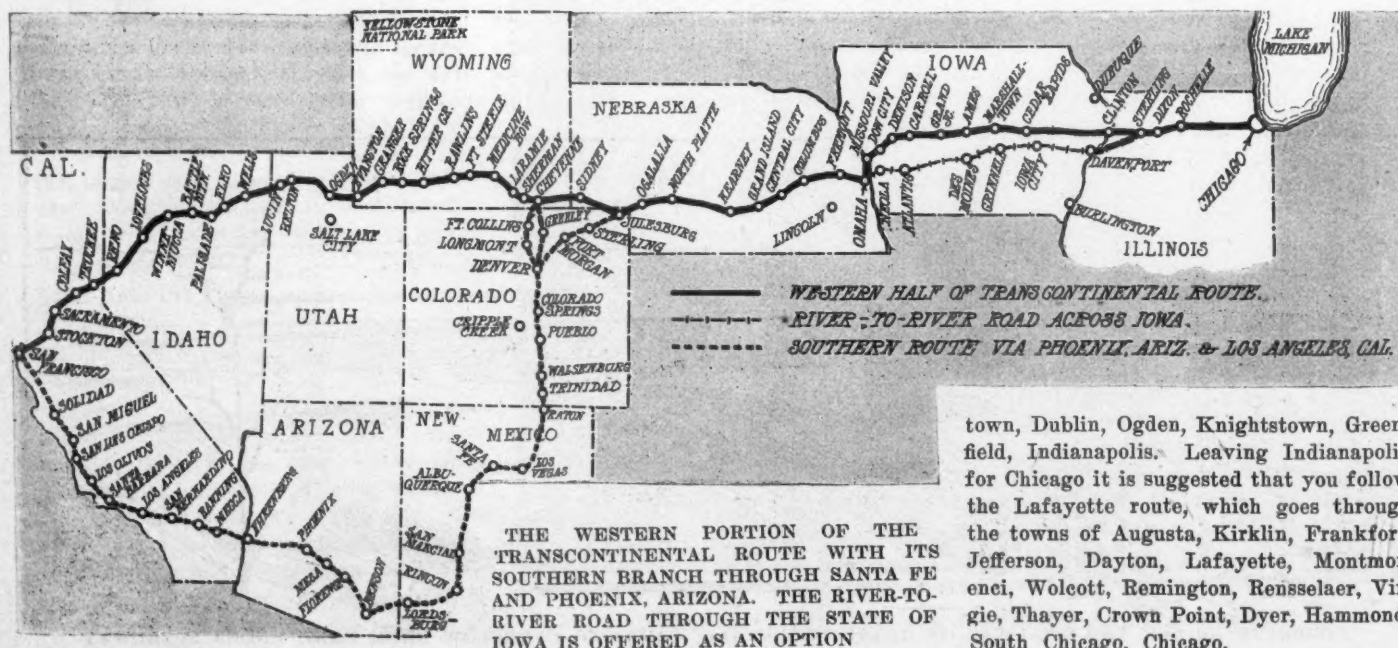
Cedar Rapids to Omaha, 297 miles, through Belle Plaine, Chelseis, Tama, Montour, Butler, Marshalltown, State Center, Nevada, Ames, Boone, Ogden, Grand Junction, Jefferson, Scranton, Glidden, Carroll, Denison, Arion, Dow City, Woodbine, Logan, Missouri Valley, Omaha.

Omaha to Cheyenne, 430 miles, is through Waterloo, Fremont, North Bend, Rogers, Schuyler, Benton, Columbus, Duncan, Silver Creek, Havens, Clarks, Central City, Chapman, Grand Island, Alda, Wood River, Buda, Kearney, Odessa, Overton, Lexington, Gothenburg, North Platte, Hershey, Sutherland, Paxton, Ogallala, Brule, Julesburg, Sidney, Cheyenne.

COLUMBUS-PACIFIC COURSE

Columbus, O.—Editor Motor Age—Will Motor Age publish a route from Columbus, O., to Los Angeles, Cal.?—Carl R. Green.

Road and weather conditions, etc., being considered, although a longer route, Motor Age suggests that you make this trip via Chicago. From Columbus go directly west to Indianapolis, through Alton, Somerford, Springfield, Donnelsville, Vandalia, Arlington, Lewisburg, Richmond, German-



town, Dublin, Ogden, Knightstown, Greenfield, Indianapolis. Leaving Indianapolis for Chicago it is suggested that you follow the Lafayette route, which goes through the towns of Augusta, Kirklin, Frankfort, Jefferson, Dayton, Lafayette, Montmorenci, Wolcott, Remington, Rensselaer, Virgie, Thayer, Crown Point, Dyer, Hammond, South Chicago, Chicago.

Information

From Chicago to Cheyenne, Wyo., follow one of the two routes outlined in the accompanying map, both of which are the main traveled routes between the middle west and the west.

From Cheyenne west over the transcontinental route through Laramie, Wyoming, Lookout, Medicine Bow, Como, Edson, Rawlins, Tipton, Bitter Creek, Rock Springs, Granger, Evanston, Ogden, Kelton, Wells, Elko, Battle Mountain, Lovelocks, Reno, Truckee, Colfax, Sacramento, San Francisco, thence down the coast through San Jose, Salinas, Soledad, San Miguel, San Luis Obispo, Los Olivos, Santa Barbara, Ventura, Hollywood, Los Angeles.

A southern route via Denver and Phoenix is outlined by dotted lines in the map.

ARIZONA TO ILLINOIS

Phoenix, Ariz.—Editor Motor Age—In the Routes and Touring Information department I note various routes from eastern points to coast points given, so I am going to ask for a route from Phoenix to Springfield, Ill. I expect to start the latter part of July and all information available looks good to me.—John Northcutt.

From Phoenix follow the route outlined in accompanying map, passing through the intermediate towns of Florence, Benson, Wilcox, Lordsburg, Silver City, Rineon, thence follow the Rio Grande river through San Marcial, Albuquerque to Santa Fe. Going over the Raton mountains it would be well to secure the services of a guide, and also provide yourself with block and tackle for mountain work. Leaving Santa Fe for Denver, Colo., a distance of approximately 430 miles, you should pass through the towns of Glorieta, Pagareto, San Jose, Blanchard, Tecolote, Los Vegas, Watrous, Tipton, Wagon Mound, Calmore, Springer, French, Maxwell City, Raton, Starkville, Trinidad,

From Chicago and Eastern Points to the Pacific Coast

Bowen, Suffield, Ludlow, Acme, Lynn, Rugby, Bunker Hill, Monson, Main, Winchell, Walsenburg, Cuchara Junction, Apache, Larimer, Verde, San Carlos, Pueblo, Eden, Bragdon, Pinion, Henkel, Buttes, Fountain, Crews, Kelker, Leander, Colorado Springs, Pike View, Breed, Pring, Monument, Palmer Lake, Perry Park, Castle Rock, Sedalia, Acegua, Littleton, Petersburg, Denver.

If you have had sufficient mountain climbing, Motor Age suggests, then, that from Denver you go east to Julesburg via Fort Morgan, passing through the following towns: from Denver: Denver, Sable, Watkins, Bennett, Moreville, Fort Morgan, Hillrose, Atwood, Sterling, Powell, Sedgwick, Julesburg. If a mountain route from Denver is preferred, then go to Julesburg via Fort Collins and Cheyenne, the route being through Longmont, Berthoud, Loveland, Fort Collins, Wellington, Cheyenne, thence Julesburg.

Continue east from Julesburg to Council Bluffs over what is known as the official transcontinental route and follows the Platte river, going through Ogallala, Sutherland, North Platte, Gothenburg, Cozad, Lexington, Elm Creek, Kearney, Gibbon, Alda, Grand Island, Central City, Silver Creek, Columbus, Benton, Schuyler, North Bend, Fremont, Waterloo, Omaha, Council Bluffs. Distance 410 miles.

Crossing the state of Iowa over the river-to-river route, 350 miles, the Blue Book outlines the route through the following cities: Council Bluffs, Underwood, Minden, Avoca, Atlantic, Brayton, Exira, Guthrie Center, Redfield, Ortonville, Des Moines, Colfax, Grinnell, Marengo, Iowa



AT THE SUMMIT OF THE CONTINENTAL DIVIDE

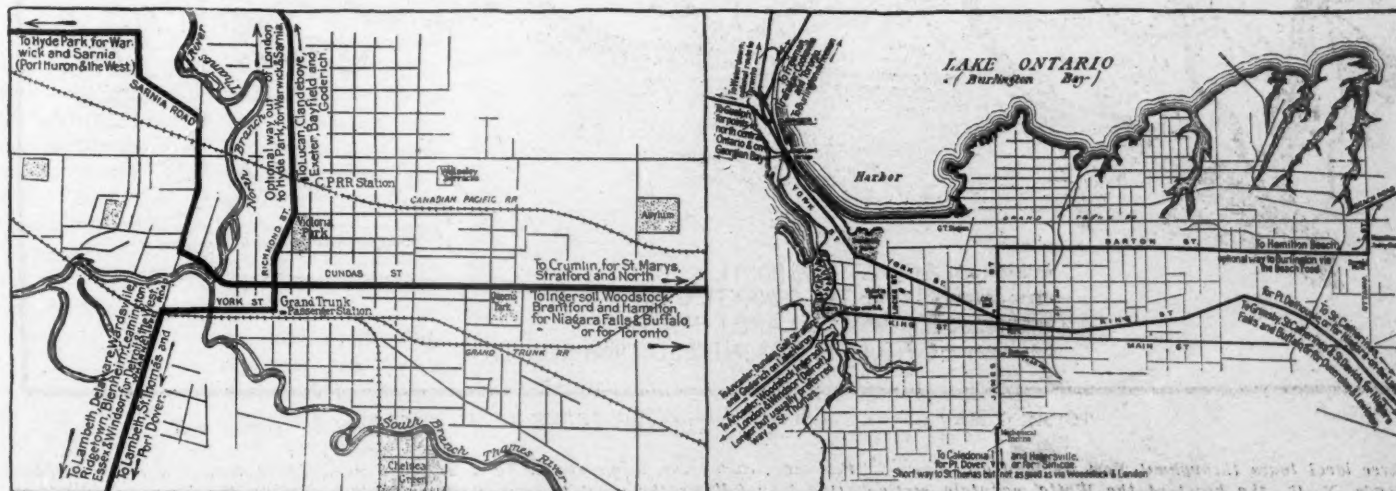
City, Moscow, Davenport. From this point to Springfield, Ill., pass through Rock, Milan, New Windsor, Alpha, Henderson, Galesburg, Knoxville, Maquon, Farmington, Peoria, East Peoria, Dillon, Delavan, Middletown, Springfield, 171 miles.

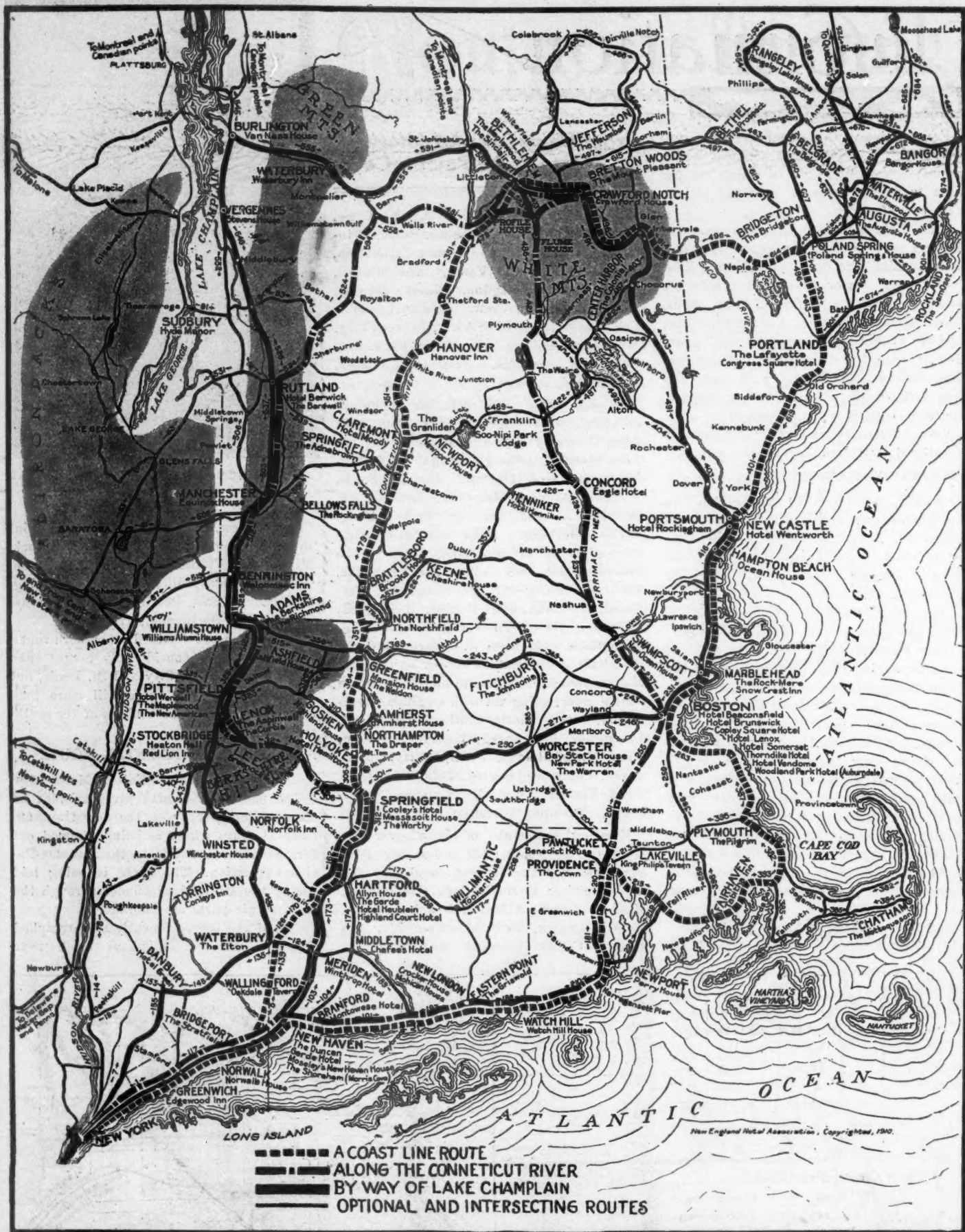
Motor Age has outlined a northern route, and one that is considerably longer than a route via Kansas City and St. Louis, but the comfort of this route will more than compensate for the discomforts of the southern route.

NEW TRANSCONTINENTAL ROUTE

Buena Vista, Colo.—Editor Motor Age—The motorist's camera gives an idea of some of the scenery on the new transcontinental route which is being mapped out for the use of tourists to the Panama-Pacific exposition. The route is being laid out by the Midland pathfinder through the more scenic parts of Colorado.

One of the scenes recently photographed shows a view of Elephant Rock near





TOURING MAP OF NEW ENGLAND SHOWING THREE IDEAL TOURS

Three ideal tours throughout New England are shown in this map, each tour being shown by a different line. These tours all reach Bretton Woods, N. H., the heart of the White mountain section. One tour follows the coast through Boston; another goes up the famous Connecticut river valley through Brattleboro; and the third goes through the Berkshire country by way of Lenox and Pittsfield and thence north through Rutland and the Green mountains of Vermont. An option is given by way of beautiful Lake Champlain, with the Adirondacks just across the lake in the state of New York and so outside of the confines of New England.

Buena Vista, which gets its name from a fancied resemblance to an elephant when seen at a distance. Another view shows the roadway at the summit of the continental divide, from which the water on one side runs to the Pacific ocean and on the other side to the Atlantic through the Gulf of Mexico.—W. A. P.

THROUGH NEW ENGLAND

Indianapolis, Ind.—Editor Motor Age—If possible will Motor Age kindly suggest what routes are best to take in making the following trip: From New York to Indianapolis, taking in Burlington, Vt., Portland, Me., and Boston, Mass., returning to New York City and thence to Indianapolis.—N. C. Allison.

From New York the coast route is a very interesting one to Bretton Woods. This route follows the Sound through New Haven, New London to Providence, and thence across the state to Boston. From Boston north to Portland the coast trip is very interesting. Generally speaking, the roads are level and in not a few places follow the ocean beach. Sand is encountered near Kennebunk and continues through Biddleford to Portland. At Portland the inland trip to Poland Springs is taken over thoroughly good roads, passing through forest much of the distance. From Poland Springs the run to Intervale—entrance into Crawford Notch, is good. The road through Crawford Notch into Bretton Woods is in fine shape. Leaving Bretton Woods the roads are well kept up by way of Bethlehem to Littleton, and thence to St. Johnsbury. There is some rough road with much clay between St. Johnsbury and Montpelier. In dry weather it is all right. In wet weather travel is very slow over it. From Montpelier to Burlington the roads are most satisfactory.

Two Roads to New York

Once you are at Burlington you have the option of two roads to New York: First, if you want to see the Adirondacks ship your car across Lake Champlain to Westport, Port Kent, or Plattsburg. You are then in the foothills of the Adirondacks. Elizabethtown is a natural center for this district and here you are a 2-day's run from New York. It is a good road all the way excepting from Elizabethtown to Seroon lake which takes you through the Adirondacks. Once at Seroon lake you strike the New York state highways which are as good as a city boulevard. This continues without interruption through Chestertown, Lake George, Glens Falls, Saratago, Albany. From Albany you have option of the following either side of the river to New York.

Second: If, however, when at Burlington you prefer to negotiate the Green mountains and also the Berkshire hills, do not cross Lake Champlain but start for Rutland by way of Vergennes and Brandon. From Brandon follow to Manchester, Bennington, North Adams, and Pittsfield. At Pittsfield you are in the heart of the Berkshire hills and continue

through Lenox, Great Barrington, Lakeview and Amenia to Poughkeepsie. From Poughkeepsie it is a pleasant trip to take the back road to Peekskill, thence to New York. For complete running directions you are referred to volume No. 2 New England edition of the Blue Book; also to Motor Age issue April 20, pages 1, 2, 3, 4, 5, 6, 7, 8 and 9, which outlines touring in New England and is illustrated with many attractive views en route as well as a full-page map showing the different routes throughout New England.

There are so many exits from New York, and not knowing the exact localities you prefer to cover, Motor Age outlines herewith the shortest and most direct route to Philadelphia, and for the many alternate routes refers you to volume 2 of the Blue Book. Leaving New York by the Weehawken ferry, west 42nd street, go to Newark, Elizabeth, Rahway, Metuchen, New Brunswick, thence to Dayton, Hightstown, Windsor, Edinburg, Mercerville, Trenton, Langhorne, La Trappe, Bustleton, Ogontz, Philadelphia.

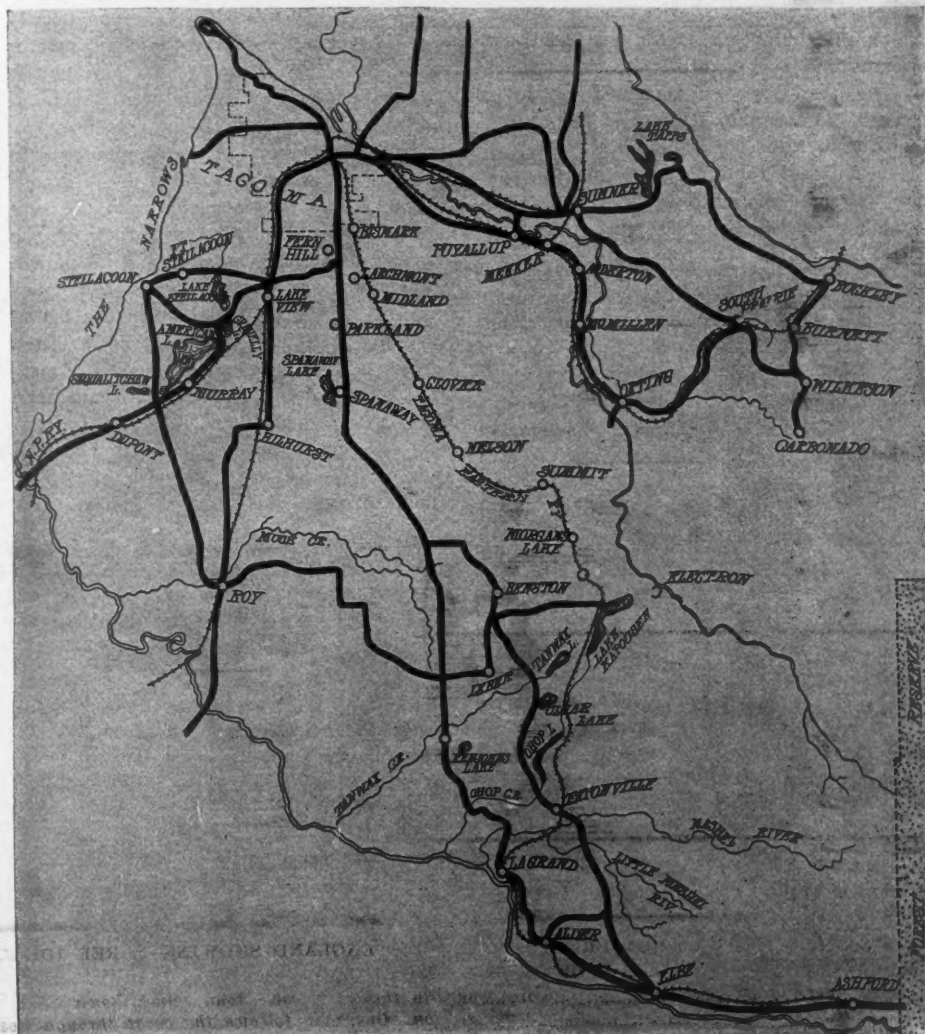
Leaving Philadelphia for Harrisburg via Reading, the direct route between these points over good pike roads, you will go through Norristown, Limerick, Pottstown, Reading, Myerstown, Lebanon,

Palmyra, Hummelstown, Harrisburg. An alternate route somewhat longer, from Reading to Harrisburg via Lancaster is through Shillington, Adamstown, Reamstown, Ephrata, Lancaster, Mt. Joy, Elizabethtown, Middletown, Steelton, Harrisburg.

Continuing westward with Pittsburg for the next objective point, the route is over pike roads through New Kingston, Carlisle, Shippensburg, Chambersburg, Fort London, McConnellsburg, Reamers, Everett, Bedford Springs; from this point to Greensburg you will encounter rough mountain road, going through the towns of Geisstown, Johnstown, Blairsville, New Alexandria, Greensburg; the balance of the road mostly macadam through Adamsburg, McKeesport, Wilkinsburg, Pittsburg.

Over National Road

Leaving Pittsburg for Indianapolis via Point Bridge over the Monongahela river and over fair country roads go through Carnegie, Washington, West Alexander to Wheeling where you will strike the National road. This National road takes you through a hilly but beautiful country. The towns on this road are Wheeling, Bridgeport, Cambridge, Zanesville, Reynoldsville, Columbus, Lafayette, Vienna, Springfield, Harshman, Dayton, Eaton,



MOTOR ROADS TO POINTS OF INTEREST NEAR TACOMA, WASH.—THE LONGEST RUN SHOWN IS TO THE GOVERNMENTAL FOREST RESERVE TO THE SOUTHWEST

Richmond, Germantown, Lewisville, Ogden, Greenfield, Indianapolis.

The New England portion of the trip is approximately 935 miles; while the New York-Indianapolis portion is about 800 miles. Over the national road and throughout Pennsylvania you will encounter many toll gates.

FROM BURLINGTON, VT., TO OHIO

Warren, O.—Editor Motor Age—I am figuring on taking a trip from here to Buffalo, thence to Rochester, Syracuse, Utica, Albany, Pittsfield, Northampton, up to Connecticut valley to Hanover and on to Bretten Woods; from there to Burlington by way of St. Johnsbury and Montpelier. Will Motor Age advise me as to the best route back from Burlington? Had thought of crossing Lake Champlain or going down to Bennington and then to Albany and return to Warren. I would also like to know the road conditions from Buffalo on, and about how much to allow for the trip, taking it leisurely. I expect to go the last of July or the first of August.—P. R. V.

From Burlington an excellent trip is to ship your car across Lake Champlain to Westport, Port Kent, or Plattsburg, which brings you into the foothills of the Adirondacks, and from which point many side trips can be made. Going to Elizabethtown you are only a day's run to Albany. From Elizabethtown to Scroon Lake you encounter a poor stretch, but the balance of the road through Chestertown, Lake George, Saratoga to Albany is fine, being one of the New York state highways.

An optional route, however, is through the Green mountains, which means stretches of mountainous roads. Instead

of crossing Lake Champlain at Burlington, go south to Rutland by way of Vergennes and Brandon. From Brandon follow to Manchester, Bennington, North Adams, and Pittsfield; thence to Albany over a nice oiled road.

From Albany to Buffalo the route is via Syracuse, Utica, and Rochester; the Albany-Utica section, 95 miles, according to the Blue book is through Schenectady, Amsterdam, St. Johnsville, Little Falls, Herkimer, Utica. It is a macadam road to Schenectady, and for the next 45 miles many dirt stretches; then macadam. Leaving Utica for Syracuse, 63 miles, go through Deerfield, Rome, Syracuse. From Syracuse to Rochester, 97 miles, over macadam road most of the way, pass through Camillus, Elbridge, Auburn, Seneca Falls, Waterloo, Geneva, Canandaigua, Victor, Mendon, Pittsford, Rochester. The balance of your trip, 74 miles, is via Batavia through Chili and Bergen; thence through Pembroke, Clarence, to Buffalo.

In order to make this entire trip in a leisurely manner you should not allow less than 2 weeks. A map of New England outlining the various routes, was published in Motor Age, April 20, and is reproduced on the opposite page.

ROADS TO TACOMA'S BEAUTY SPOTS

Tacoma, Wash.—Editor Motor Age—From a standpoint of picturesque beauty and variety of scenery, the many motor roads radiating from Tacoma can hardly be excelled on the Pacific coast. One of the most picturesque highways built entirely for motor cars is the Canyon road to Mount Tacoma. The road is a continuous ribbon, a smooth pavement from the center of Tacoma to the very foot of the glaciers of the famous mountain. A person can reach from a motor car at the upper terminus of the road and touch the ice of Nisqually glacier. There are other such highways winding around beautiful American lake, Gravelly lake, Steilacoom lake and Lake Sequelitchew. A paved drive connects the center of the city with the edge of the Narrows, an arm of Puget sound, several miles west of Tacoma, and

another leads through beautiful paved streets to the well-known Point Defiance park.

Up to the Mount Tacoma forest reserve, where the government road stretches in weather-hardened beds to beyond Indian Henry's hunting ground, the county has built and perfected a highway unexcelled both for easy traveling and scenic beauty. The mountain is approached by two principal routes. In addition, wide, level highways skirt all the borders of Pierce county and connect by short routes the farming and commercial sections.

Of the 860 miles of road in the county there are 25 miles of special oil and gravel finish, 415 miles of well-graveled roads and the remainder earth roads, kept constantly in good condition. Ten miles of road are surfaced with crushed rock.

The Mount Tacoma canyon road is the particular pride of Pierce county authorities. For 7 miles it pierces heavy forests, immense trees skirting the highway on either side. Of the two routes approaching the mountain joining at the border of the reserve one leads past Eatonville, close to the line of the Tacoma Eastern railroad, while the other passes Ohop near the Thurston county line. This latter route is receiving special attention from the county commissioners at present. What is known as the Range Line road, part of this route, will be made a bee-line highway for a distance of about 16 miles. Though it will dip at times and mount slight ridges, it will not pass from a direct route.—F. K. H.

FOLLOWS OLD GLIDDEN ROUTE

Hope, Ark.—Editor Motor Age—Will Motor Age furnish me with the Glidden tour route from Hope, Ark., to Dallas, Tex.—E. P. Steward.

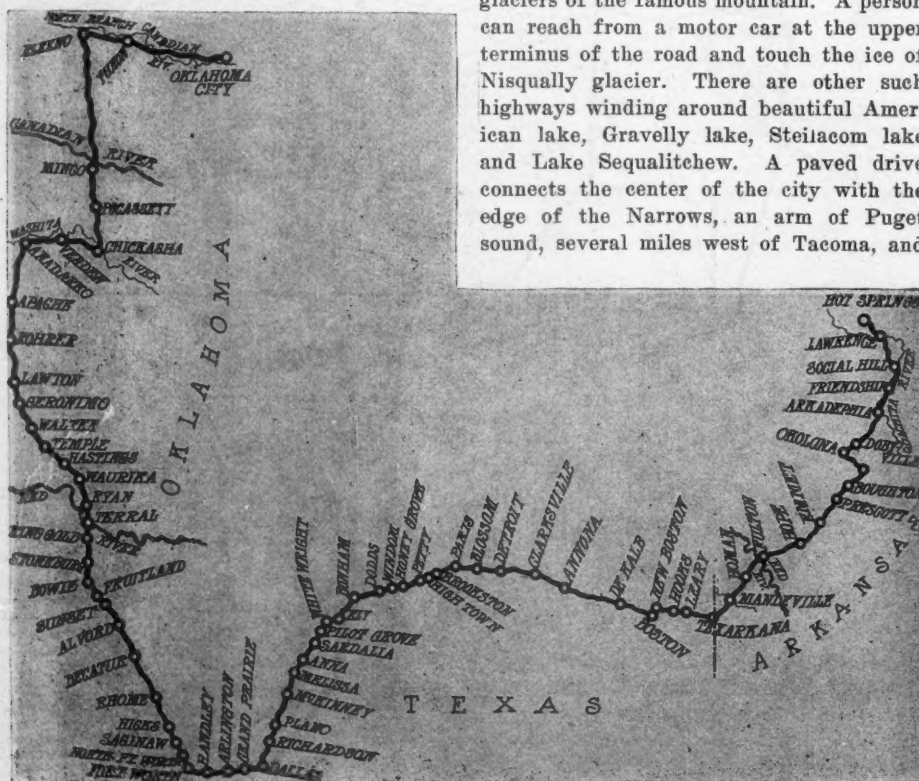
The route followed by the Glidden tourists in 1910 between the points named is as follows: Hope, Fulton, Homan, Mandeville, Texarkana, Leary, Hooks, New Boston, Boston, De Kalb, Annona, Carlsville, Detroit, Blossom, Paris, Brookston, Hightown, Petty, Honey Grove, Dodds, Bonham, Ely, Whitewright, Pilot Grove, Sedalia, Anna, McKinney, Plano, Richardson, Dallas. Distance, 254 miles. The route is outlined in the map on this page.

SAN ANTONIO TO SIOUX CITY

Will Motor Age please give me the best route from San Antonio, Texas, to Sioux City, Ia.? Kindly make a map diagram of the route.—A. M. Warren.

Leaving San Antonio for Fort Worth, 192 miles, you will pass through Selma, New Braunfels, Goodwin, San Marcos, Buda, Austin, Round Neck, Georgetown, Granger, Bartlett, Holland, Little River, Temple, Lorena, Waco, West, Abbott, Hillsboro, Lovelace, Itaska, Grandview, Cuba, Cleburne, Crowley, Fort Worth.

Fort Worth to Oklahoma City, 314 miles, is through Saginaw, Hicks, Decatur, Sunset, Bowie, Stoneburg, Ringgold, Ryan, Hastings, Geronimo, Lawton, Rohrer,



ROUNDABOUT ROUTE FROM HOT SPRINGS TO OKLAHOMA CITY

Apache, Anadarko, Chickasha, Pocasset, Mineo, El Reno, Yukon, Oklahoma City. This section of the route is what is known as a portion of the Glidden tour route of 1910. An alternate route from Fort Worth to Oklahoma City, recommended by a San Antonian, is through Denton and Gainesville, then following the Santa Fe railroad to Oklahoma City, as shown by the dotted lines in the sketch map on page 19 of this issue.

Oklahoma to Kansas City, 451 miles, go through Britton, Guthrie, Orlando, Enid, Kremlin, Medford, Caldwell, Kas.; Drury, Riverdale, Wichita, Newton, Peabody, Florence, Clements, Plymouth, Emporia, Lebo, Waverly, Williamsburg, Ottawa, Wellsville, Gardner, Olathe, Shawnee, Rosedale, Kansas City.

Kansas City, Mo., to Sioux City, Ia., 352 miles, through Wallula, Leavenworth, Lowemont, Atchison, Hall, South St. Joseph, St. Joseph, Savannah, Maryville, Burlington Junction, Tarkio, Shenandoah, Randolph, Omaha, Council Bluffs, Crescent, Missouri Valley, River Sioux, Onawa, Whiting, Sloan, Salix, Sioux City.

HOT SPRINGS TO OKLAHOMA CITY

Hot Springs, Ark.—Editor Motor Age—Kindly publish a map or a motor route from Hot Springs, Ark., to Oklahoma City, Okla.—James P. Addison.

Covering a distance of 712 miles, the route from Hot Springs, Ark., to Oklahoma City, Okla., as traversed by the Glidden tourists in 1910, is outlined in the map on page 18 of this issue. The towns passed through are: Hot Springs, Lawrence, Arkadelphia, Okolona, Beirne, Prescott, Hope, Fulton, Homan, Texarkana, Hooks, Boston, Clarksville, Blossom, Brookstown, Bonham, Sedalia, McKinney, Plano, Dallas, Grand Prairie, Arlington, Fort Worth, Saginaw, Rhome, Decatur, Bowie, Ringgold, Ryan, Hastings, Lawton, Apache, Anadarko, Chickasha, Mineo, El Reno, Oklahoma City.

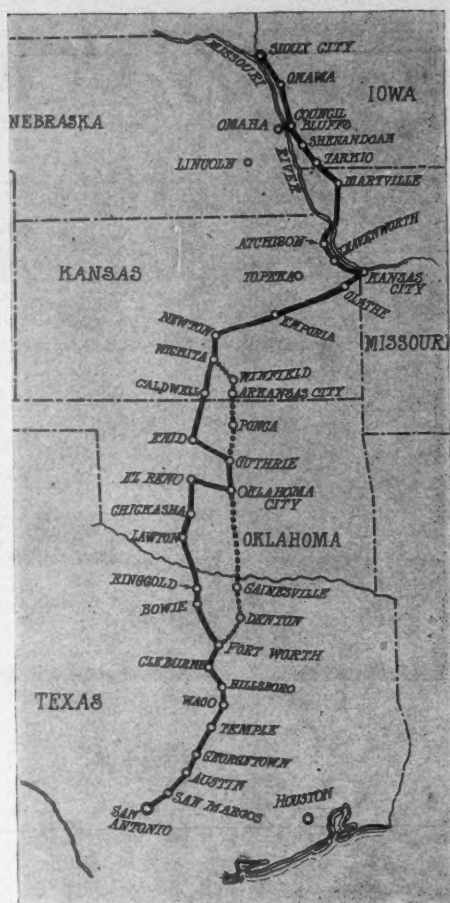
SHORT NEBRASKA ROUTE

Hickman, Neb.—Editor Motor Age—Through the Routes and Touring Information department will Motor Age give me the best route from Hickman to Atkinson, Neb.—F. P. L.

Leaving Hickman you will traverse a fine section of Nebraska as far as Neligh, going through Lincoln, Germantown, David City, Columbus, Humphrey, Madison, Tilden, Neligh. From this point through the town of O'Neil to Atkinson you will find some sandy country.

FEES FOR CANADIAN TOURING

Detroit, Mich.—Editor Motor Age—As I wish to make a tour of the following cities, beginning July 8, will Motor Age inform me relative to the different state laws with a Michigan license: Detroit to Buffalo via Canada; thence to New York, Philadelphia, Atlantic City, Washington, Pittsburg, Cleveland, then home. What other Blue Book besides Vol. 1 do I need? —A. R. S.



SAN ANTONIO TO SIOUX CITY. DOTTED LINE SHOWS OPTIONAL ROUTE BETWEEN FORT WORTH AND WICHITA, KANSAS

Your Michigan tag which must be displayed, grants you the free use of the highways of the states of New York, Pennsylvania, Ohio, Indiana, and Illinois. In New Jersey, a license must be secured from the commissioner of motor vehicles, Trenton, N. J., which is good for 8 consecutive days, or for four periods of 2-days each during the calendar year. Fee \$1. A Maryland license must be secured from the commissioner of motor vehicles, 508 Union Trust Building, Baltimore, Md., for a 7-day permit. Two of these permits are granted during the year.

On entering Canada a deposit of \$25 must be paid to the custom officials, which is refunded on leaving Canada, and bond for double the amount that would have to be paid on the car if it remained in Canada must be signed by two Canadians. This will permit of an owner going back and forward to the United States as often as desired. If you simply wish to pass through Canada you are allowed 30 days of grace, and if identified with a motor club the formality of a bond is not necessary provided you do not wish to stay over 30 days. In this case all that is necessary is a declaration of the names, description of car and number of passengers, details as to extra equipment. A card will be issued which is surrendered to the custom official when returning to the United States. According to the Blue Book you can secure special arrangements through

the C. S. Warner Co., custom house brokers, Niagara Falls, Canada; Niagara Falls Auto Transit Co., Niagara Falls, N. Y., J. M. Duck, Windsor, Ont., and A. J. Chester, Sarnia, Ont., whereby they can furnish bond and customs touring permit for \$5, no cash deposit being required.

Blue Book, Vol. 4, covering the Middle West, in conjunction with Vol. 1 will give you complete running directions, etc., on the route desired.

RUN THROUGH ILLINOIS

Cabery, Ill.—Editor Motor Age—Kindly give me the best route from Cabery, Ill., to Joliet, Ill.—Charles E. Christ.

Motor Age suggests that you go to Dwight, then follow the Blue Book route through Mazon, Morris and Minooka.

KALAMAZOO TO SAGINAW

Kalamazoo, Mich.—Editor Motor Age—Kindly publish the best route from Kalamazoo to Saginaw, Mich., returning via Flint and Detroit, Mich.—J. Stillman.

Leaving Kalamazoo for Saginaw, you should pass through Galesburg, Battle Creek, Marshall, Albion, Jackson, Leslie, Mason, Holt, Lansing, Owosso, New Haven, Layton Corners, Saginaw, covering a distance of 187 miles, as laid out by the Blue Book.

Returning via Flint and Detroit, leave Saginaw for Bridgeport, thence on through Pine Run, Mt. Morris, Flint, Pontiac, Birmingham, Detroit, Dearborn, Wayne, Ypsilanti, Ann Arbor, Chelsea, Grass Lake, Jackson, Albion, Marshall, Battle Creek, Galesburg, Kalamazoo, a distance of 233 miles, as against 187 miles on the outgoing journey, according to the Blue Book.

SHORT ILLINOIS ROUTE

Carlock, Ill.—Editor Motor Age—Through the Routes and Touring Information department will Motor Age give me a good route from Bloomington to McLeansboro, Ill.—A. R. Moore.

Over good roads in the dry season the route from Bloomington goes through Heyworth, Wapella, Clinton, Maroa, Decatur. Leaving Decatur, follow the line of the Illinois Central railway practically all of the way to Pana, passing through Macon, Moweaqua, Assumption, Pana. At Pana go west up a long hill, turn to the left at first road, pass graveyard and follow this road into Oconee; go straight south on east side of the railroad, and follow the main traveled road into Ramsey. Go south of Ramsey, crossing the Clover Leaf railroad; turn left; go to the first road which turns south; follow this road to the first main traveled road turning to right; follow this road into Vandalia. At Vandalia take the southern route through Shobonier, Vernon, Patoka, Fairman, Sandoval, Centralia. This will be found to be a good road if no rains occur, but in case of rains it is recommended that you go east to avoid the Kaskaskia river bottom. The balance of your trip to McLeansboro, a distance of about 55 miles, is through Walnut Hill, Dix, Mt. Vernon, Dahlgreen, then McLeansboro.

CHICAGO—Editor Motor Age—In the issue of Motor Age of July 29 I note the reply to questions from Stillman Valley, Ill. Being familiar with the circumstances which brought out this first question, I will say, Stillman Valley so worded his question that he failed to cover the point. He asks, "Is any part of the load carried on the outer shell of a semi-floating rear axle?" Had Stillman Valley added these words, "which is not carried by the drive axle," he would have covered the point.

Judging from the reply made him as to a semi-floating axle, the reply would be; no. My reply would be; yes. In the examination of the construction of rear axles, I have found three general types. Motor Age divides them in two types. I submit three illustrations of the different types. For convenience, I will mark them Figs. 1, 2 and 3. In Fig. 1 we have the general type of floating axle. This clearly shows the load carrying bearings B placed on outside of axle housing. They are so placed that they do not come in contact with the driving axle A in any way. This allows the driving axle to float free in its bearings, relieved of all weight of car. This, I believe, agrees with the description of floating type of axle. The word floating, is here used descriptive of the relation of the driving axle to the load.

In the description of the semi-floating type, Motor Age says: "In this construction the wheel is attached directly to the transverse driving shaft and secured thereon. The driving shaft in this case not only serves to propel the wheel but it also supports the weight of the car." Motor Age also gives Fig. 4, herewith reproduced and designated, wherein it clearly shows a type in which the driving axle carries the whole load. In order to call this a semi-floating type of axle, it will be necessary to change the sense of floating as here applied. Motor Age calls the other type floating because relieved of all weight of car—then calls this type semi-floating, because relieved of no weight of car.

I think Motor Age made this error through overlooking the type of axle shown in Fig. 2. Here it plainly shows the inner bearing B next the gear housing, placed be-

The Readers'

tween the driving axle A and the axle housing H. In so placing this bearing, it would put part of weight of car on the driving axle.

Motor Age will now notice the outer bearing O. This is placed on the outside of the

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

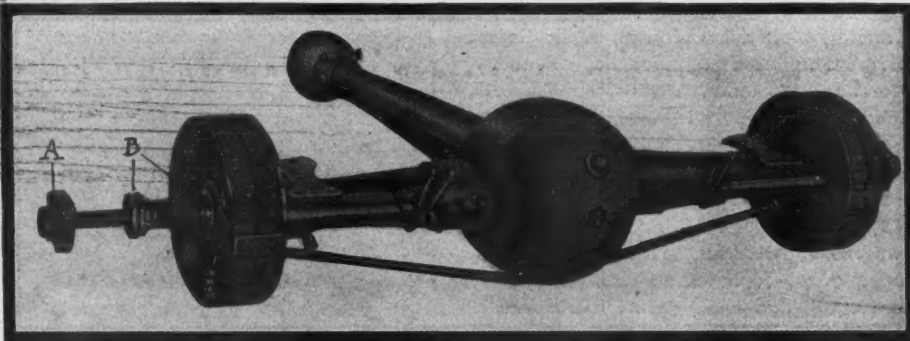


FIG. 1—A REGULAR FLOATING TYPE OF REAR AXLE WHICH SUPPORTS ENTIRE LOAD

axle housing. The hub of the wheel is constructed with a flange F which comes outside and rests on this bearing. The wheel is attached directly to the transverse driving shaft and secured thereon. It can readily be seen in this type of construction that the load is carried partly on the axle housing and partly on driving axle, thus becoming semi-floating.

In Stillman Valley's first question, referring to a semi-floating axle, he adds, "I understand the bearings are all within the outer shell." My reply to this is; they may or may not be.

Taking the type of axle I have just described, the outer end of the axle housing may be so enlarged that it will receive the roller bearings on the inside, the flange on the hub being small enough in turn to go inside of these bearings. This puts both bearings within the outer shell. It is merely reversing the order of the first described semi-floating axle.

We now come to the third type of axle, Fig. —. The illustration and description of a semi-floating axle fully covers this type

of axle. It is a misnomer to call this type of axle semi-floating in the same sense as we did in the type of axle in Fig. 2. All the weight of the car being transmitted to driving shaft, thence to wheel, it becomes non-floating.

There are many variations in the assembling of the three described axles, yet each would belong to one of the three types. In the discussion of this question I have considered one-half of a shaft-driven rear axle only.—F. D. Johnston.

The above criticism seems a very fair one, and is worthy of the attention of those interested in the prevailing motor car nomenclature. As suggested, the axle shown in Fig. 2 is more truly a semi-floating type in the strictest sense of the word semi-floating, whilst the so-called semi-floating axle shown in Figs. 3 and 4, really is not a floating type; the term non-floating, therefore, seems a very practical one.

INSPECT TRANSMISSION MECHANISM

Oakland City, Ind.—Editor Motor Age—I have a 1910 model 24 Oakland car and the clutch, transmission and differential all get very hot in a 15 or 20-mile run. There is a grinding noise running on high. Can Motor Age tell me through the Readers' Clearing House the cause of this trouble?—O. Morgan.

Your trouble seems to be due either to a lack of oil or the use of an improper grade in the various parts of your car; or, it is possible that dirt, grit, or some other sort of abrasive has gotten into your lubricant or been put there by some one having evil designs upon you. Then, again, it is possible that through some accident or through an error on the part of a repairman, that misalignment exists between the gears of the rear axle and gearset, which would cause the grinding noise. In the Oakland car regular cylinder oil is used for the clutch and transmission, while hard grease is em-

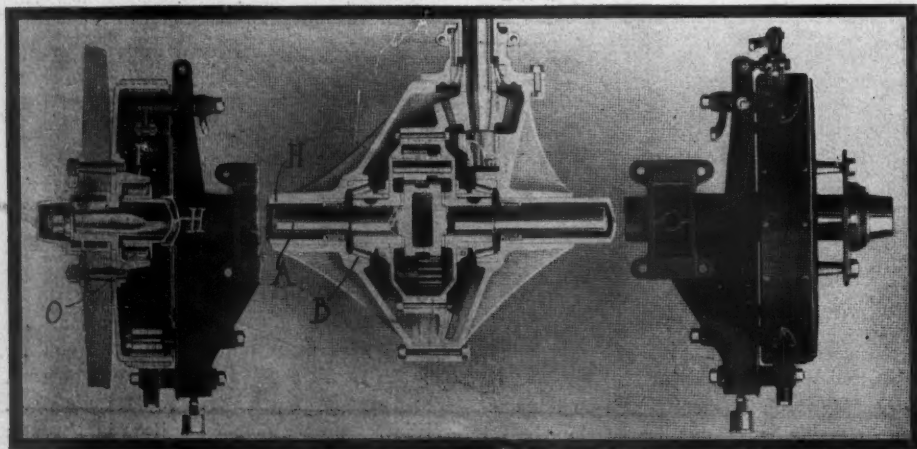


FIG. 2—A TRULY SEMI-FLOATING TYPE OF REAR AXLE

Clearing House

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

1—The chattering or grinding of gears which takes place when you try to go into first speed may be due to an improper condition of the lubricant in the clutch house with gasoline most probably would eliminate it. A thorough cleaning and flushing out

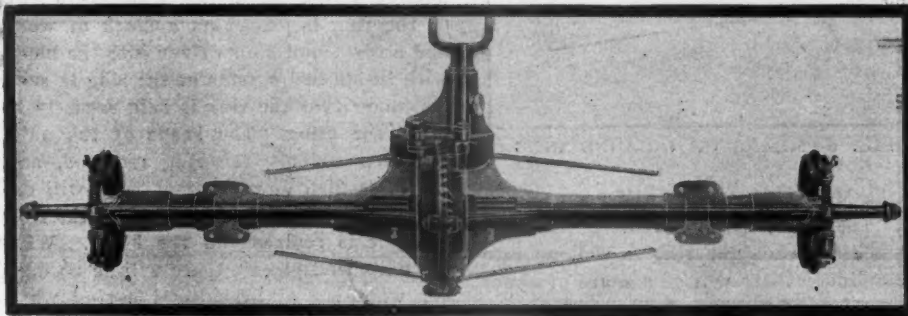


FIG. 3—SO-CALLED SEMI-FLOATING REAR AXLE WHICH IS NOT SEMI-FLOATING

ployed for the rear axle and differential mechanism. If after seeing that the troublesome parts of your motor are thoroughly supplied with the proper lubricant you find that the trouble still exists, Motor Age would advise that you have the entire transmission mechanism of your motor, including the rear axle, dis-assembled, cleaned, and inspected by some reputable repairman.

GEARS CHATTER

Lima, O.—Editor Motor Age—Would Motor Age please answer the following questions through the Readers' Clearing House:

1—The gears chatter when going into first speed on a Chalmers 30 1910 model. Would it be possible to put on a clutch brake? If so, where can I get one or how can I make one?

2—How many trucks do the Gramm make monthly? What is the plant capacity?

3—Will a black body and green running gear be a 1911 color?

4—At times when my motor is running good and well heated up it will suddenly back-fire, then it may repeat several times and the motor will stop firing and slow down but usually begins exploding again just before it stops. The carbureter adjustment and wiring are all right.—J. H. Cable.

much of your trouble. To clean the clutch remove the plug in the bottom of the clutch case, and flush with kerosene. Next replace the plug and pour in 1 quart of light cylinder oil.

It also must be borne in mind that in order to shift gears quietly the speed of the clutch or main shaft must be as nearly equal to that of the counter shaft of the gearset as possible. Therefore, when about to throw in the first speed with the car standing still, one should wait a few seconds after throwing out the clutch so that the spinning shaft will have lost its speed, then there will be little trouble and noise in getting the gears into mesh. Another point to be remembered is that the faster the motor is running the longer the clutch is liable to spin, therefore, it is good practice to throttle down the motor before attempting to shift the gears. A little practice should enable one to shift gear noiselessly.

It would be possible to have a clutch brake put on, but it should not be necessary if the clutch is put into good order, and the gears properly shifted. There are no clutch brakes on the market applicable to the Chalmers construction. A few different type of clutch brakes in use are shown on page 16, June 8 issue of Motor Age.

2—It is stated that the Gramm company makes from 80 to 100 trucks per month.

3—Motor Age does not keep data on the periodical color combinations of cars.

4—Your trouble seems to be due either to water in the carbureter, or to dirt in the float chamber which occasionally is drawn up into the spraying nozzle, momentarily choking off the supply of fuel and spoiling the mixture. Drain about a cupful of gasoline from the carbureter by removing the plug from the bottom of the float chamber; also see that the vent hole in the filler-cap of the gasoline tank is not plugged or covered.

ELIMINATING A KNOCK

Victoria, B. C.—Editor Motor Age—Will Motor Age tell me through the Readers' Clearing House what is a piston ring knock, and can it be remedied? I have a Winton six which runs perfectly quiet and gives satisfaction in every way, but sometimes when standing with the motor running idle there is an awful clicking noise. It starts and it sounds, at times, as if it would split something open. I do not know whether I am right in supposing it to be a piston ring knock or not, but it seems to be according to a description of a piston knock in Motor Age, issue April 27.—A Constant Reader.

A piston ring knock is a light sharp clicking sound caused by rings that are loose in their grooves as indicated at B in Fig. 9. Though it is possible that such is the cause of the noise in your engine, it is perhaps even more likely that the piston pin is loose, or the rod loose on the piston pin; this would give rise to a deeper sound than the clicking of a loose piston ring.

To remedy the trouble, first locate the cylinder in which the noise occurs. This may be done by sounding with a file, or a stick of hard wood or the like, while the motor is running. If a file is used, the end of it should be placed at various points on and about the cylinder head while the ear is lightly but firmly pressed against the end of the wooden handle. In this way, when the cylinder in which the knocking occurs is tested, the noise will be very much more distinct than when the other cylinders were sounded.

When the noisy cylinder is located, remove the one-half of the crankcase, and while cranking the motor over slowly see if the knocking can be felt or heard, then direct

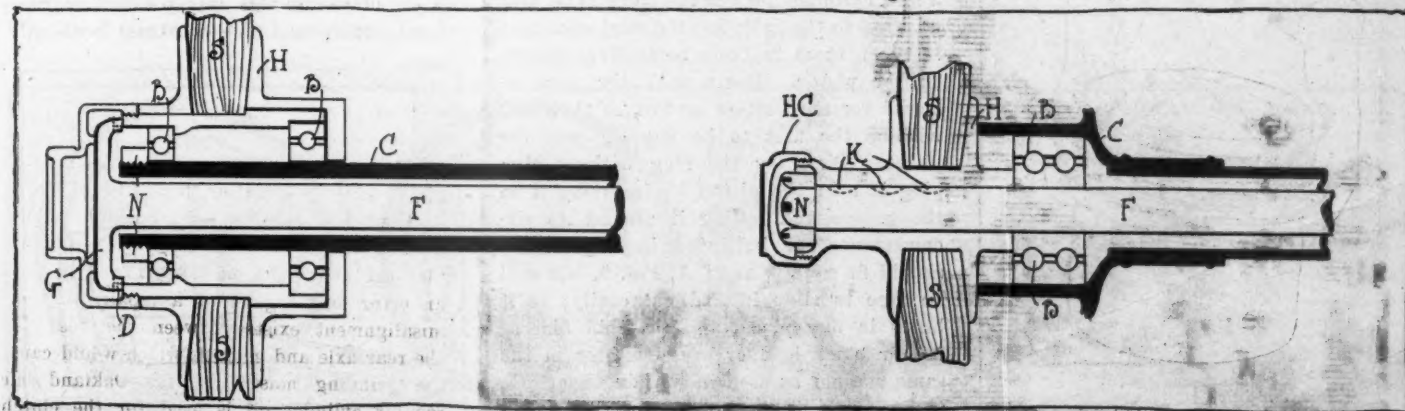


FIG. 4—DIAGRAM SHOWING PRINCIPLE OF FLOATING AXLE, AT LEFT; AND SO-CALLED SEMI-FLOATING TYPE, AT RIGHT

a light into the cylinder and try to see if the side of the connecting-rod is sliding on the piston pin and striking the sides of the piston. If you cannot see up into the cylinder, take hold of the top of the connecting rod so that the finger and thumb of one hand rests half on the top of the rod and half on the piston boss in which the pin rests, then have the crankshaft oscillated back and forth a $\frac{1}{2}$ -inch or more. If there is any lost motion it will be felt and must be removed to eliminate the knocking. If the piston pin and rod are in good shape disconnect the rod from the crankshaft, remove it and the piston from the cylinder, and examine the piston rings.

FITTING PISTON RINGS

Los Angeles, Cal.—Editor Motor Age—Kindly answer the following question through the Readers' Clearing House: We have a model I Mitchell, 1908 model. I would like to know the proper way of fitting new piston rings in the cylinders. —Edward P. Haupt.

Like all other mechanical operations, the fitting of piston rings is comparatively simple—if you know how; but in the hands of the novice many are sprung and some are broken. Most manufacturers, of which Mitchell is one, now cut the grooves in the piston, and grind the face and edges of the rings to a gauge, making very little hand-fitting necessary. But there are cases, and these are the ones that generally come into the repair shop, where the cut was just a trifle larger, or the ring a little smaller than the gauge, making it essential that each ring be individually fitted to the groove in which it shall subsequently rest.

To properly dress down a ring requires some skill, and a good mechanic will select a ring which will demand the least amount of trimming, for it is a delicate operation. After having selected a set of rings, the first operation is to fit them into the cylinder. Taking one of the rings, try very carefully to shove it straight in, concentric with the cylinder walls; if the ring is of the diagonal-slot type and its diameter a little large, the ends will run upon each other, throwing the edges out of line; while if a ring with square-cut overlapping ends is used, such as is to be found

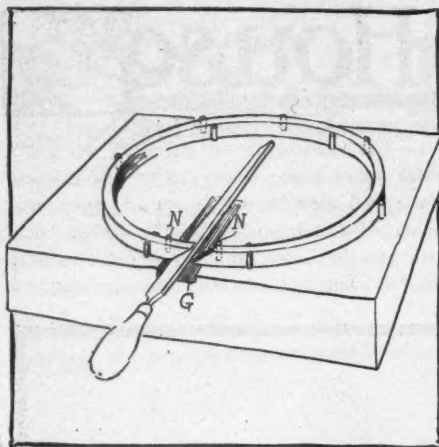


FIG. 6—MEANS OF HOLDING RING

in the Mitchell motor, it will not go in at all. Therefore, the ends must be trimmed off so that when the ring is well up into the cylinder there will be a space of about 8 to $\frac{15}{1000}$ of an inch between the ends, to allow for expansion caused by the heat of the motor. The groove G on the block shown in Fig. 6 is used in reducing the size of the diameter of diagonally-slotted rings. A thin, smooth, flat file is best used for this purpose and it should be placed between the ends of the ring with its bottom edge in the groove G. The ring must then be pressed together so that its ends bear against the surfaces of the file as it is moved forward. The ring should be repeatedly tried in the cylinder in order that the space is not filed to exceed the above dimensions. The inside portions of the rings near the ends should rest against the nails N, in order that they may not be broken off when filing the slot. Having attained the proper space between the ends of the ring, now place a light in the cylinder behind it and see how its face conforms to the wall of the cylinder. If there is good contact all around, the ring is ready to be fitted to the piston; but if the contact is poor, either the ring or the cylinder is out of round, leaving space between cylinder wall and the ring as at C and P in Fig. 9. If the fault lies in the ring the face can probably be dressed down to fit, or another selected; but if the cylinder is badly out of round it will have to be rebored or reground, or both, as the case may be, or replaced with a new cylinder. When the rings have been adapted to the cylinder, the next operation is to fit them in their respective grooves on the piston. Begin with the ring selected for the bottom groove, so that ring will be the first to be slipped onto the piston. First try the ring without slipping it over the piston by inserting it in the groove and rolling it around its circumference, as indicated in Fig. 8. It should fit snugly, as at A, Fig. 9, but still be free to slide in and out easily; if it binds in any place, apply a thin film of red or black lead or prussian blue in the same manner as used in scraping bearings, to locate the high places, then dress down with the thick, smooth, flat file and try

again. When filing is necessary, it should be confined to one edge in order that at least one good edge is retained, for it is almost impossible to secure as regular a surface with a file as that made by a grinding machine. An example of ill-fitting rings is shown at B, Fig. 9; and at the left in Fig. 9 the space C shows that the ring was sprung in putting it on the piston.

A very simple and effective means of holding a ring for fitting is shown in Fig. 6; the ring is placed on a block of wood and a few small nails driven into the block both inside and outside of the ring in such a manner that the ring is held securely in place for filing. The heads of the nails are then cut off, the ring removed, and the nails filed down so that they will extend just below the top surface of the ring when it is replaced on the block. With the nails well placed, there will be no danger whatever of breaking the ring when filing. Another simple and effective method of dressing down a ring to fit a groove is shown in Fig. 9; a piece of cotrus cloth is laid upon a surface plate or some such flat surface, then the ring is carefully rubbed around on it in the manner indicated in the illustration. Having fitted one ring, put it in place immediately and repeat the operations with the next ring. A quick and safe method of slipping rings into their grooves is shown in Fig. 5. Take three strips of sheet metal, brass or tin, for instance, about $\frac{3}{4}$ inch thick, $\frac{1}{2}$ inch wide and 5 inches long; bend these at right angles and hang them on the edge of the piston at equal distances apart. The ring may then be slipped over these till it is opposite its groove, when the strips may be removed and the ring allowed to slide into place. The same strips may also be successfully used in removing rings.

Emery cloth should not be used in this work, as cast iron is very porous. Grains of emery which will remain in the pores, work out later and cause much damage.

CLEANING THE CRANKCASE

Streator, Ill.—Editor Motor Age—I would like Motor Age's opinion on the following: What causes the oil in the reservoir of my E-M-F 30 to become mixed or black, apparently from oil in the crankcase? I washed out the crankcase this spring with kerosene oil. I replenished the crankcase with oil



FIG. 5—REMOVING OR REPLACING RING

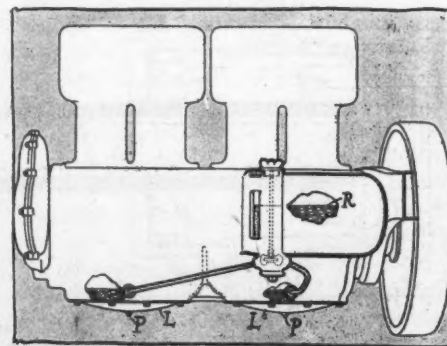


FIG. 7—E-M-F OILING SYSTEM

through the breather pipes. Would an oversupply in the crankcase cause it to mix with the oil in the reservoir or is it caused from defective valves? I always keep the reservoir pretty well filled, but am satisfied that I got too much in the crankcase at the time of filling through the breather pipes.—W.S.

Owing to the relative positions of the oil reservoir R, Fig. 7, of your motor, and the splash compartments of the crankcase, it hardly is possible for the oil in the crankcase to get back into the reservoir unless, perchance, the splash compartments of your case were practically flooded with oil. In this case it might be well to entirely drain the oil from the motor and reservoir, then flush out the entire system by removing the plugs P or plates L, then pouring or squirting kerosene or gasoline through the reservoir and allowing it to drain out.

CAUSE OF A KNOCK

Sauk Center, Minn.—Editor Motor Age—I was once troubled with a knock in my engine and all my efforts to find and remedy it were unavailing, for a time at least. It bothered me greatly, inasmuch as I feared what it would ultimately lead to if allowed to continue, so I looked at this thing and the other thing, but could not find it. When I would go up hill the knock would be more in evidence, especially when the engine was working hard and going slowly. I opened the crankcase, looked over the shaft, connecting rods, both top and bottom bearings, and would then try it again, and still that mysterious knock would appear as soon as the engine worked slowly and hard; but at other times it would not appear, and the machine would run nearly as quietly as the stars.

I had about given up locating this mechanical ghost when one day as I was cleaning up my machine and adjusting all parts that needed it, I thought of the knock again and began to reason what on earth it could possibly be, as I used the best cylinder oil obtainable, the cylinders were free from carbon, the motor was properly adjusted so as not to have any play in any of its bearings other than right. I had taken out the bevel-gear, differential, clutch and gearset and all were right and properly adjusted—but still I could not find anything that could possibly lead to that knock.

After I had the machine put together I went to put on the hood and inad-

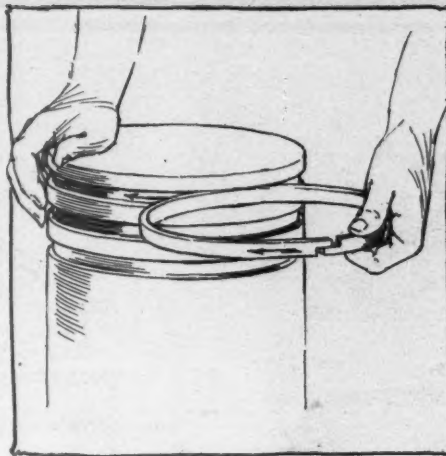


FIG. 8—TRYING RING ON PISTON

vertently touched the small strip of board on which it rests, and, presto! the knock was found! The board running the whole length of the hood and fastened by two bolts which held it to the steel frame or chassis of the car, one of them had lost out and when the car would labor or pull slowly this board would slowly knock against the steel frame in such a way as to make one think there was trouble for him somewhere in his engine or gearing. I put in a new bolt, tightened it down and tried the car out over the same roads and hills and the knock was gone.—A. D. Carpenter.

GEAR RATIO CORRECTION

Howard, Kan.—Editor Motor Age—I am a constant reader of the Motor Age, and especially the Readers' Clearing House, and I find many things there that are of help and interest to me. I would like to call attention to a mistake Motor Age made in the reply to the inquiry of Victor Warner, of Kansas City, in the issue of July 6. In the course of the reply it was stated that the gear ratio of 3 to 1 means that the road wheels revolve three times to one revolution of the motor. This, however, is the reverse of the fact. If the statement were true the car in question would travel at the rate of 300 miles per hour when the engine was running at normal speed of 1,000 revolutions per minute with a gear ratio of $3\frac{1}{2}$ to 1.

As the case actually is, the change of the tires from $3\frac{1}{2}$ by 34 to 4 by 35 would result in a change of 1.1 miles per hour increase in speed of the car with the engine running at 1,000 revolutions per minute.

The change in the gear ratio would be from $3\frac{1}{2}$ to 1 to $3\frac{2}{107}$ to 1 or a difference of .27 revolution of the engine. Or, in other words, the car would be driven .91 inches farther every revolution of the engine.—A Constant Reader.

Motor Age not only sees and corrects the error, but thanks the reader for calling attention to it. The passage referred to read: "The wheels make three revolutions for every one of the motor, etc." It should have read: "The motor makes three revolutions for every one of the wheels, etc."

EQUIPPING FORD FOR RACING

Stillwater, Okla.—Editor Motor Age—We wish to equip a 1911 model T Ford for racing. Will Motor Age kindly state whether or not this can be done by simply increasing the size of the driving gear? We thought of making this gear with fourteen teeth, but does Motor Age think this practical?—Inquirer.

You cannot change the gear ratio of your car by simply enlarging the driving pinion, or rather by using a driving pinion having a greater number of teeth without getting a driven gear to match it. The teeth would have to be smaller, for the diameter of the pinion could not be increased owing to lack of space for it in the rear axle housing. Motor Age would advise that you consult with the Ford Motor Co., Detroit, which undoubtedly can furnish you with a racing rear axle having a $2\frac{1}{2}$ to 1 ratio, or perhaps some other ratio which you will find more adaptable to the conditions under which you are to race the car.

LONG TIRE SERVICE

Mokena, Ill.—Editor Motor Age—On page 29, issue Motor Age June 29, I note a letter from W. T. Cropper, Sargent, Neb., regarding tires with more rubber on the sides to resist wear of ruts, etc. I wish to state that in using a tire-pressure gauge, one of which is connected to each tire at all times, over 60,000 tire miles have been recorded. My conclusions regarding a tire for ruts, as well for general long wear on the tread, is that it is not the thickness of rubber that is the most important thing, but rather the wear-resisting quality of the composition and the perfection of the cure. There is, I believe, substantial reasons limiting the thickness of rubber on the sides of the tires, but not so good ones for having the center of the tread almost as thin as the sides.—E. A. Terpening.

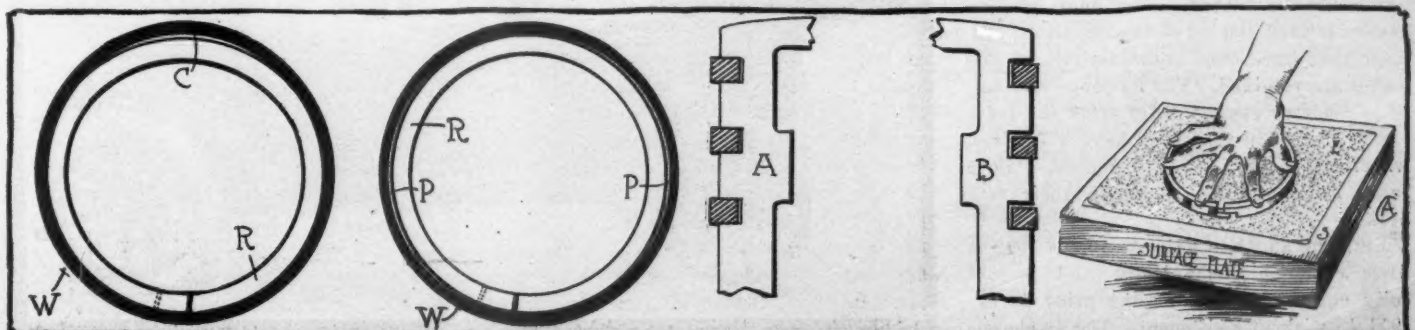


FIG. 9—SHOWING EXAMPLES OF PROPER AND IMPROPERLY FITTING RINGS, AND HOW TO DRESS THEM DOWN

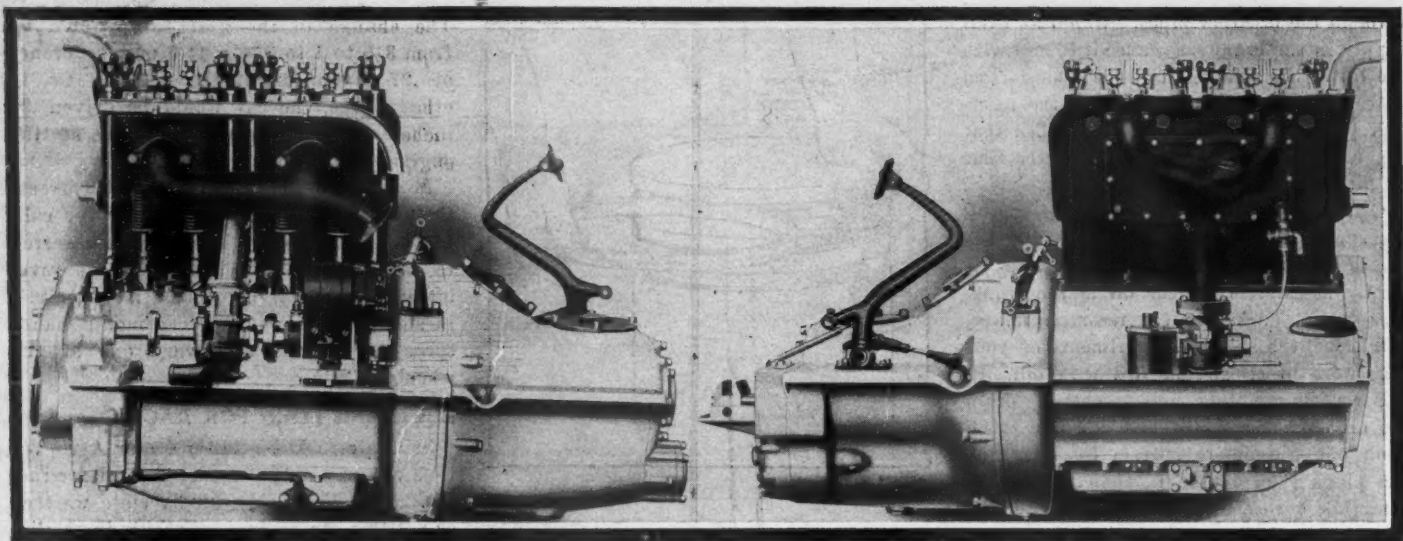


Fig. 1—Two views of the unit power plant used in the new model 36 Chalmers for the season of 1912, which is almost identical with this year's model 30, except that it has a $4\frac{1}{4}$ -inch bore and $5\frac{1}{4}$ -inch stroke, an unusually large and conveniently arranged oil filler, a Rayfield carburetor with dash adjustment, an aluminum web from the crankcase to the frame to protect the motor from road dirt, a compressed air self-starting device whose features are illustrated and described on the following page, and a number of other minor refinements in detail.

FOR 1912 the Chalmers line will comprise three chassis models carrying thirteen different body styles. Foremost among these is the Chalmers 36, the new model, which has a motor built along the same lines as that of the 30 of this year, and which is equipped with a compressed air self-starting device.

The characteristic features of the new model 36 are: the unit power plant shown in Fig. 1, shaft drive with two universal joints, a floating rear axle, 36 by 4-inch wheels, a wheelbase of 115 inches and a four-speed gearset. To this chassis will be fitted four body types, including a fore-door touring car, fore-door pony tonneau, Berlin limousine and cab side limousine.

The Chalmers 30 and 40, with which the public already is familiar, are continued with no radical changes but with such improvements and general refinements that another season's development has made practicable.

Thirty in Five Body Types

The Chalmers 30 for 1912 appears in five body types: a fore-door touring, fore-door pony tonneau, open front pony tonneau, torpedo roadster, and inside-drive coupe. All types this year are sold fully equipped and, except the coupe, at the same price as the 1911 touring car without equipment. All 30 bodies, except the open-front pony tonneau, are of the full fore-door type and, like the 36, all have the forward compartments ventilated. The dual ignition system is used and all of the important features that have been characteristic of this model are retained. The 30 coupe and torpedo roadster chassis differ from the regular 30 chassis in that they have a 102-inch wheelbase instead of 115 inches. Both carry large gasoline tanks on their rear decks.

Like the 30, the Chalmers 40 for 1912 is little changed mechanically and is sold fully equipped for the same price as the 1911 40 without equipment. The 40 chassis has a wheelbase of 122 inches and carries

The Chalmers Line for 1912

Three Chassis Models Offered Carrying Thirteen Different Styles of Bodies, with the 30 and 40 Continued and the 36 Added to the Line

Old Models Are Changed But Little

three body types: a fore-door touring car of seven passengers' capacity, a torpedo of four passengers' capacity, and a detachable pony tonneau of four passengers capacity which is readily convertible into a racy roadster.

As for the mechanical details of the new 36, the motor has its cylinders cast en bloc, as shown in the illustrations, with the inlet valves in the heads and operated by pushrods and rocker arms, and have their springs enclosed in brass jackets, whilst the exhaust valves are in offset pockets on the sides as in an L-type motor, and operated directly by pushrods from the same camshaft that operates the inlet valves. This construction permits of the use of extra large valves, which facilitate the passage of the gases. The cylinders have a $4\frac{1}{4}$ -inch bore and $5\frac{1}{4}$ -inch stroke,

as compared with the 4 by $4\frac{1}{2}$ -inch cylinders of the 30; and the internal mechanical details of the entire motor are quite clearly shown in Fig. 5.

The crankshaft is of the same short stubby two-bearing type, which has been a feature of the 30 since its inception, and other distinctive features claimed for this motor are: a new piston ring which eliminates motor-smoking; an unusually large camshaft, and pushrod tappets of extreme size; unusually heavy rocker arms and a new crankcase construction which protects the upper working parts of the motor from road dirt.

The crankcase of the motor, which is of cast aluminum, is of the barrel type, in which the crankshaft, with its two large annular ball bearings intact, is shoved into place from the rear end. The construction

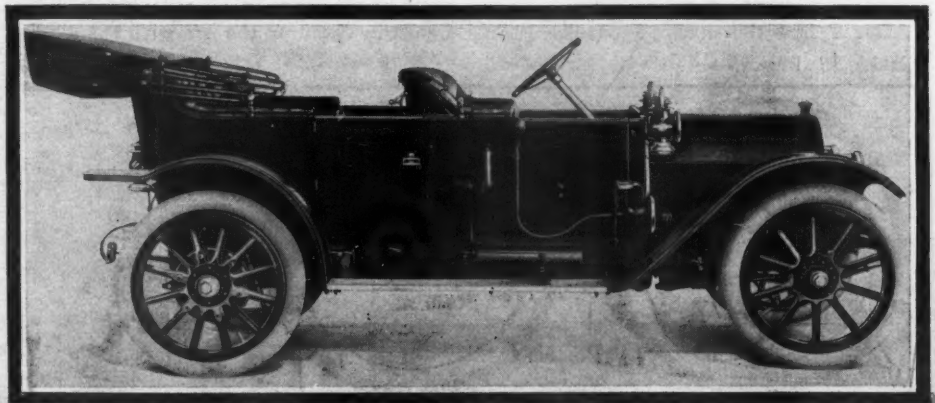


FIG. 2—THE CHALMERS 36 FOREDOOR TOURING CAR FOR 1912

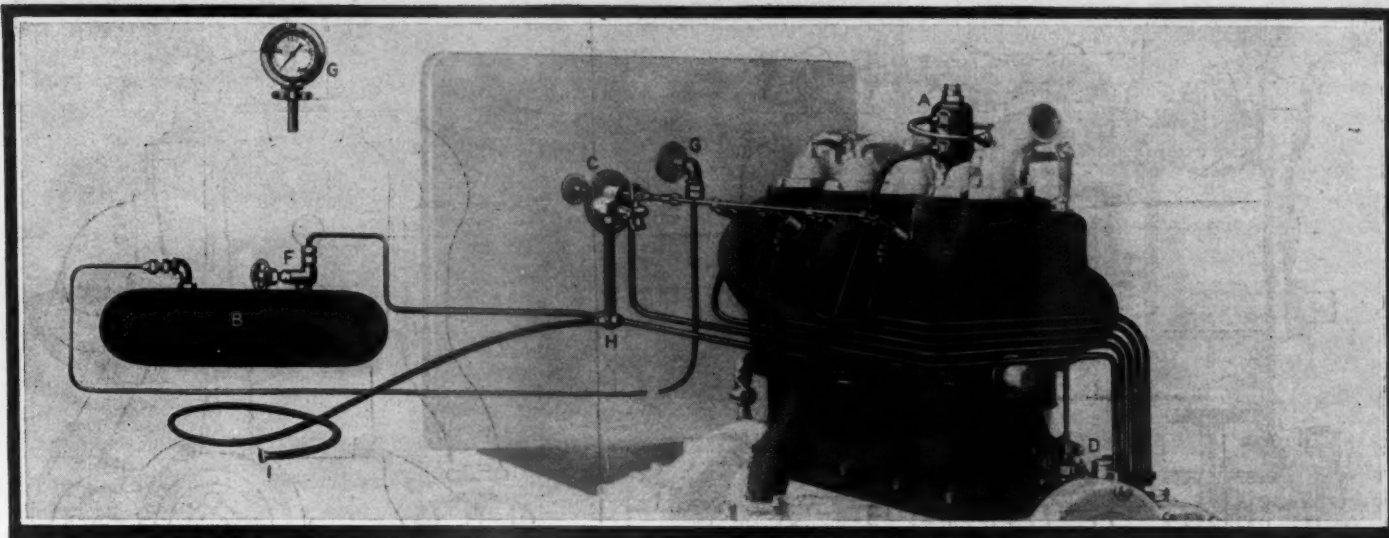


Fig. 3—Showing the features of the compressed air self-starting device which is a part of the regular equipment of the Chalmers model 36. In this system air is forced from No. 1 cylinder through the check-valve A and suitable piping to the storage tank B carried under the body of the car. When it is desired to start the motor the valve C on the dash is opened, and air released from the tank is conducted to the distributor D, which delivers it to the cylinders at E. G is a gauge on the dash, H the tire hose connection, and I the tire valve connection

New Ideas in Chalmers 36

Self-Starter Which Also Can Be Used for Inflating Tires One of the Innovations—Four-Speed Gearset Also Found on Newcomer

Fore-Door Bodies Continue to be Popular

of this case differs from that of the 30 in that an integral web closes in the space between the motor and the frame. The motor is supported on four short stout legs cast integral with the case; two of these being opposite the front end of the motor and two opposite the encased fly-wheel.

Circulating Splash Lubrication

Lubrication of the motor is by means of a constant level splash system with a gear pump to maintain the circulation. A lower portion of the case, which forms the oil reservoir, is detachable for inspection of the internal crankcase mechanisms and adjustments of the connecting-rod bearings. When the motor is in operation the oil, after being drawn through a strainer, is forced by the gear pump from the reser-

voir, back into the splash compartments of the crankcase proper, and the overflow from these splash compartments returns to the reservoir below, to be again strained and recirculated.

Cooling is by means of forced water circulation, and features of the system are a Fedder's cellular radiator, short direct water connections of large diameter, a ball-bearing belt-driven fan and a centrifugal water pump. Ignition is by means of a Bosch dual system with a single set of plugs and a dash coil which pierces the dash so that just the switch portion is visible. The switch is provided with a lock and key; all ignition wires are neatly arranged and thoroughly protected from heated portions of the motor; and all connections are of a simple and substantial

design that should eliminate ignition

On the new model is used the water-jacketed intake manifold, and a water-jacketed Rayfield carburetor, a clever and convenient feature of which is a dash lever that permits of adjustment of the needle valve from the driver's seat. Thus the mixture from the carburetor can readily be enriched so that the motor will run smoothly and with plenty of power at very low speeds, and lightened for economy and speed at the higher speeds without raising the hood to reach the carburetor. All types of the 36 are provided with gasoline pressure systems.

The Chalmers Self-Starter

Perhaps the most distinctive feature of the Chalmers 36 is the air pressure self-starting device with which all types are equipped. The Chalmers self-starter is not an accessory but an integral part of the power plant. In this system compressed air is forced from No. 1 cylinder through a suitable check-valve and piping to a storage tank carried under the body of the car. When it is desired to start the engine a valve conveniently located on the dash is opened and air released from the tank, which is conducted to a distributor operating upon the same principle as the commutator used on almost all cars having double ignition systems. By means of this distributor the compressed air is delivered into the cylinders, which are ready for the working stroke in their order of firing; thus the motor is operated by compressed air instead of cranking.

It is claimed that this new feature of the Chalmers 36 has been tested on three different cars in more than 20,000 miles of driving, and it never once failed to work. Some idea of the power of the self-starter may be gained from the claim that it is possible to set the gears in second speed, shut off the ignition system and actually drive the car from stand-still, using compressed air to run the motor. The only troubles.

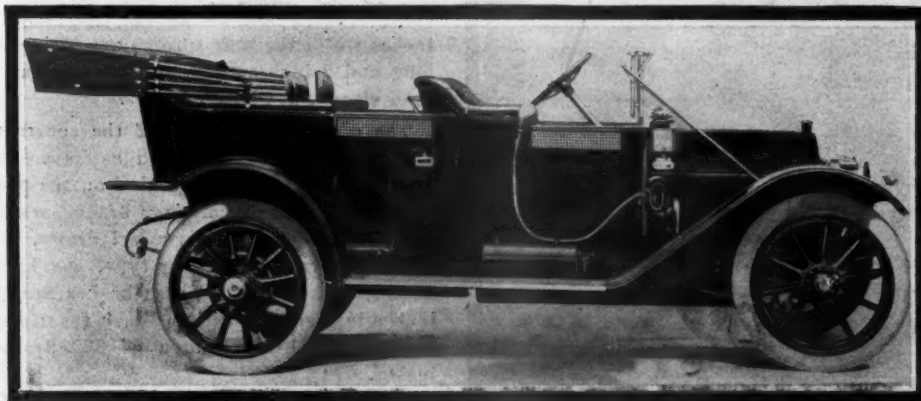


FIG. 4—FOREDOOR SEVEN-PASSENGER CHALMERS 40 FOR 1912

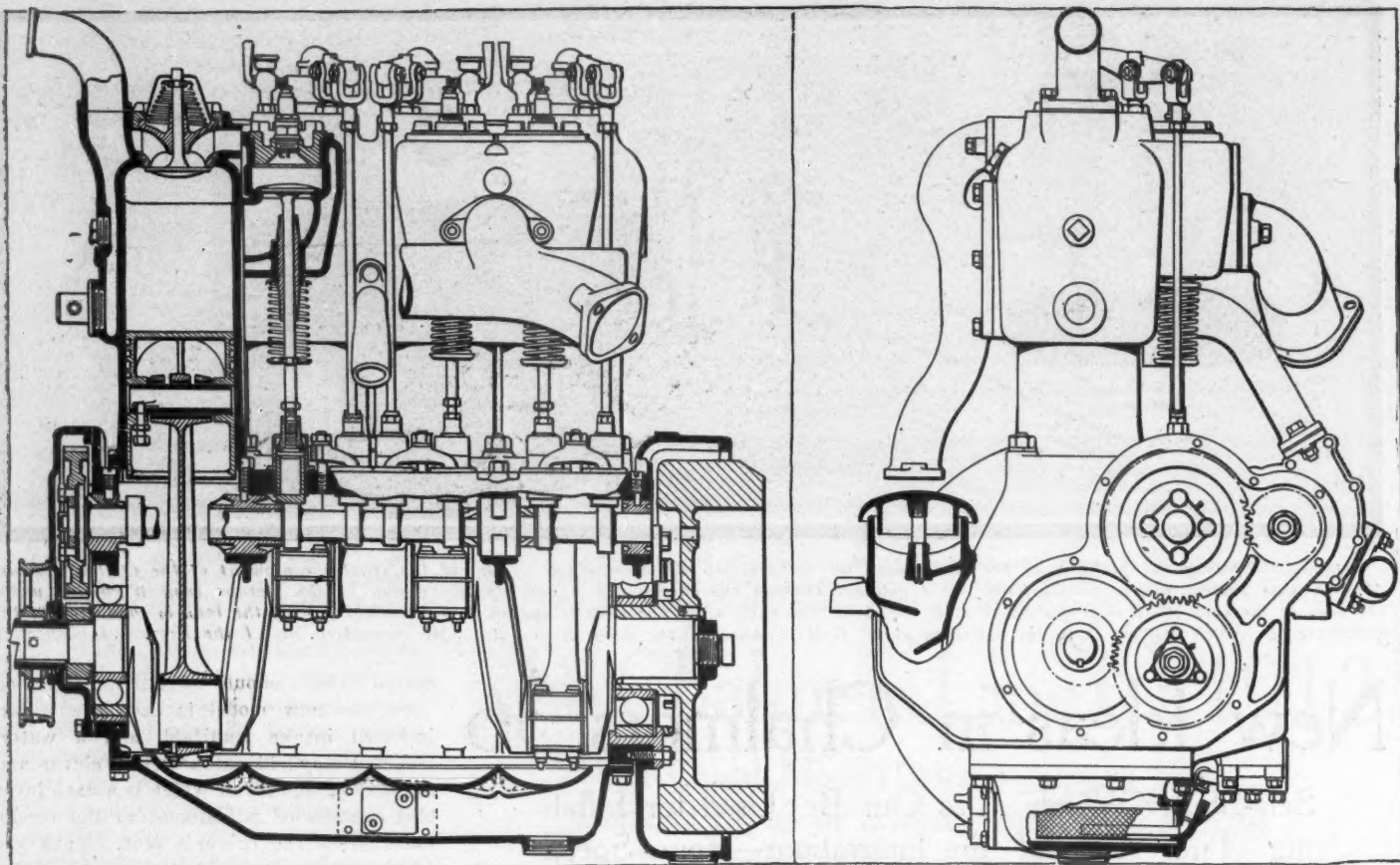


Fig. 5—Sectional side and end views of the Chalmers 36 motor, showing many interesting details of construction. With the inlet valves in the heads and the exhaust valve on the sides the valves are unusually large; inlet valve springs, guides and stems are protected from dust and dirt by brass caps. Valve tappets and pushrods are adjustable, pistons have four compression rings; the crankshaft is mounted and has two large ball bearings; the flywheel is enclosed; oil reservoir detachable; the oil filler and breather very large, and all piping short and direct

circumstance under which the self-starter will fail to work is when the motor is on dead center, a condition which seldom exists in a ball-bearing motor. In such circumstances the crank has to be used to turn the motor an inch or two, when the self-starter will do the rest.

Also Inflates Tires

In connection with the self-starting device is a tire inflater, and this combined with the Continental demountable rims, with which all types are equipped, removes the greater part of the inconvenience of

tire trouble and adds to the car's efficiency.

From the motor, power is transmitted through a clutch of the multiple-disk type, comprising thirty-nine alternating phosphor bronze and tempered saw steel disks, which operate in a bath of oil. The gearset, which is of the selective sliding gear type, gives four forward speeds and reverse, and is contained in a one-piece aluminum case, which bolts to the flared rear end of the motor crankcase to complete the formation of the unit power plant. Thus the flywheel, clutch and clutch operating mechan-

isms are for the most part thoroughly encased, and perfect alignment of the motor, clutch and gearset is assured. The main and countershafts of the gearset are in the same vertical plane, with the countershaft arranged directly below the main shaft, and both shafts are short and mounted in annular ball bearings.

The rear axle casing and torque arms are of pressed steel, which, for the rear axle, is claimed to have greater strength than the older style of cast steel housing. The front axle is an I-beam drop forging, with integral spring perches, and Timken roller bearings are employed throughout on both front and rear axles. The double drop frame is a pressed channel steel construction, mounted on semi-elliptic front and three-quarter elliptic rear springs. The front springs are 39 inches long and 2 inches wide; the rear springs are 45 inches long and 2 inches wide, and the car has a road clearance of 10½ inches.

The service brakes are of the contracting type with asbestos-lined bands acting on steel drums, and are located on the rear wheel hubs. The emergency brakes, which also operate on the rear-wheel drums, are of the internal expanding type, and have asbestos-lined shoes. These brakes are 14 inches in diameter with a 2-inch face; giving a total braking area of 362 square inches.

As for control, the spark and throttle levers of the 36 are located at the top of

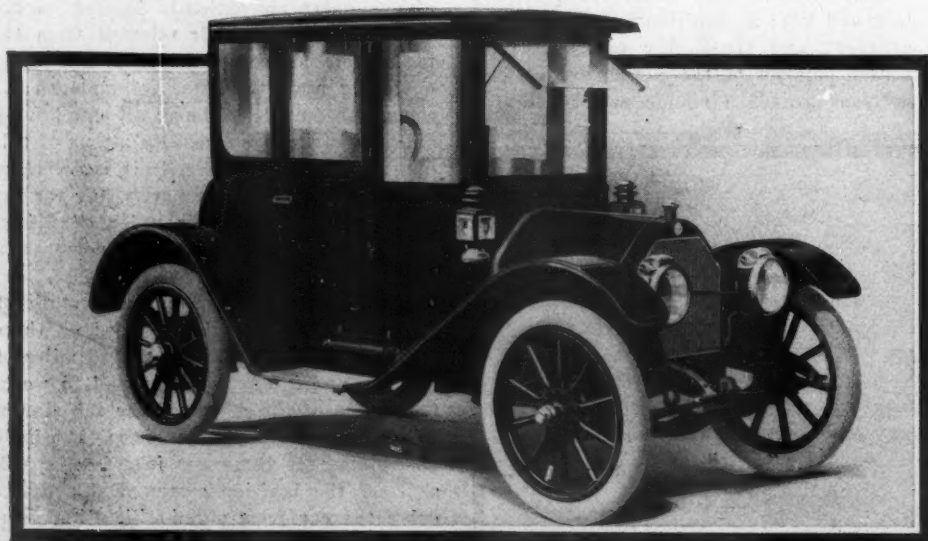


FIG. 6—CHALMERS 1912 MODEL 30 COUPE

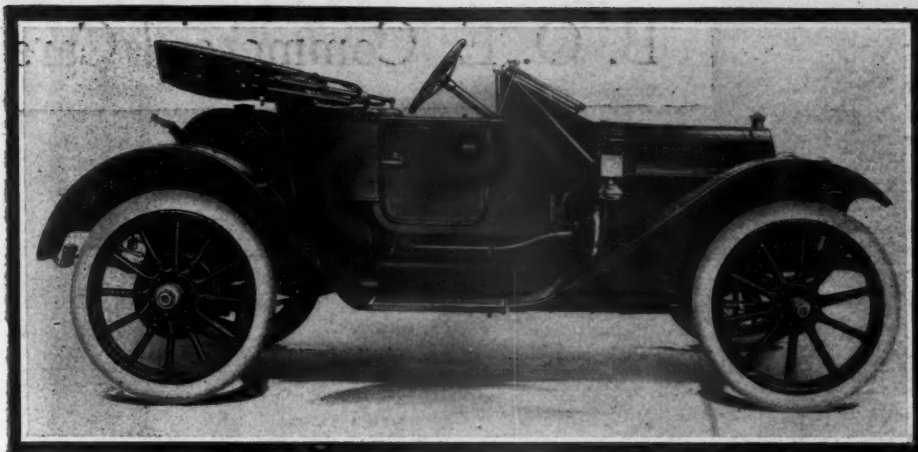


FIG. 7—CHALMERS 1912 MODEL 30 TORPEDO ROADSTER

the steering column over the wheel and can be operated without removing the hand from the steering wheel. The clutch and service brakes are operated by a single pedal, pressure upon which first throws

H. Cameron and his corps of assistants. This building is practically completed and will be occupied in the course of a month. It is a reinforced concrete structure of 40 by 150 feet, having three stories and a

ond floor are the engineering offices with dining room, chemical laboratory and sample room. The sample room is where all parts of the car, such as lamps, horns and magnetos, etc., are kept, there being one sample of each, which will serve as a standard for the different shipments to be checked with. The third floor is the detail room of the drafting department and blueprint room.

MOTOR CAR LITERATURE

"How to Keep Down Your Tire Expense" is an interesting booklet issued by the United States Tire Co., New York, dealing with the care and use of pneumatic tires. The book is well illustrated. There is a chapter dealing with the subject of building a tire; another is devoted to troubles, their causes and prevention; and a third to aids for injured tires.

Elegant in its simplicity, rich in its soft, dainty colorings, the 1912 catalog of the Packard Motor Car Co., Detroit, is truly an edition de luxe. The complete Packard

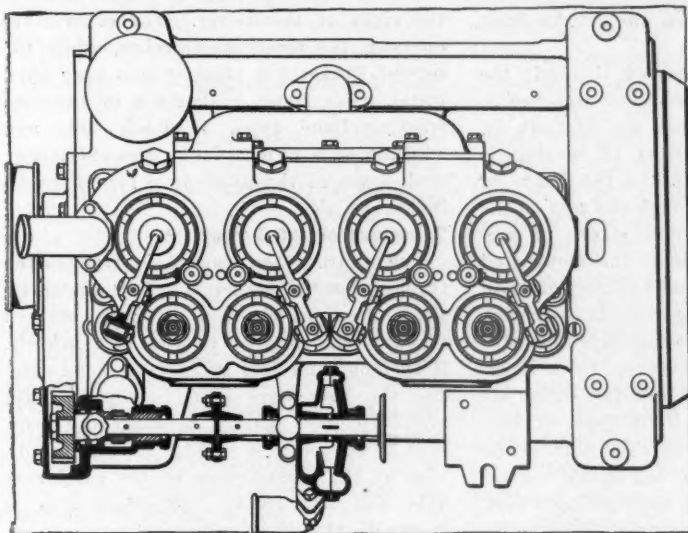


Fig. 8—A top view of the Chalmers 36 motor, showing the relative arrangement of the valves, and details of the water pump construction and drive

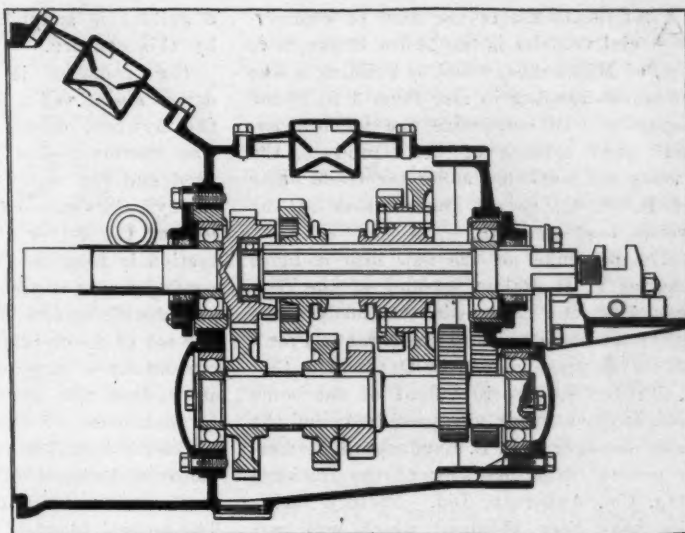


Fig. 9—A side sectional view of the Chalmers 36 gearset, showing short, stout shafts on ball bearings and compact construction throughout

out the clutch and, if continued, applies the service brakes. The emergency brakes and gear changes are operated by means of levers at the right of the driver's seat. The foot accelerator is of an improved type, combining the advantages of the button and lever types. It is so constructed and located that its use does not tire the foot.

OVERLAND FACTORY ENLARGED

With an output of 16,300 Overland cars this year and a contemplated output of 20,000 for the coming season, the Willys-Overland Co. has found it necessary to increase its factory capacity. As a result foundations already are laid for a new building 300 feet wide and 400 feet long. It will have four stories and basement. According to present plans the first floor will be given over to assembling chassis work and the remaining floors to body manufacture and painting.

Another building enlargement is the new engineering building for Designer W.

basement. The lower floor is devoted to board room, physical laboratory and model room, the latter for all models of new parts pertaining to the car. On the sec-

ond floor are the engineering offices with dining room, chemical laboratory and sample room. The sample room is where all parts of the car, such as lamps, horns and magnetos, etc., are kept, there being one sample of each, which will serve as a standard for the different shipments to be checked with. The third floor is the detail room of the drafting department and blueprint room.

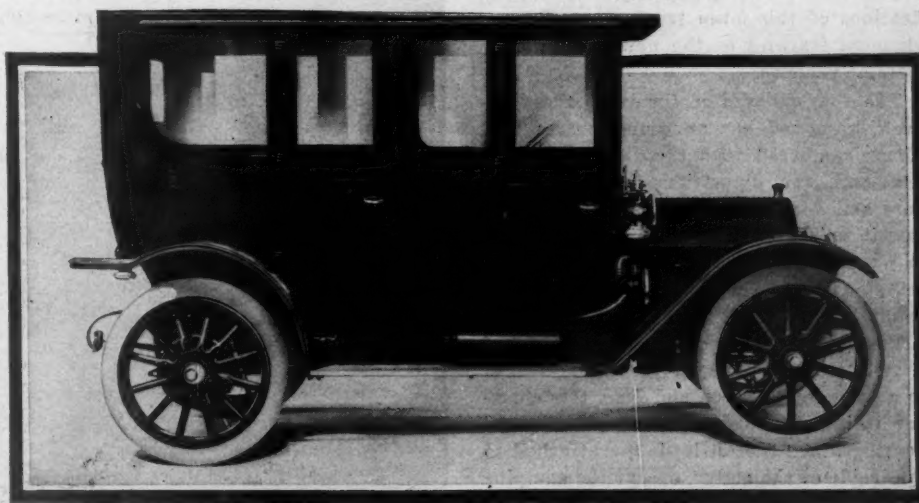


FIG. 10—CHALMERS 36 BERLIN LIMOUSINE

B. O. E. Commercial Cars



FIG. 1—NEW B. O. E. 6-TON TRUCK WITH DUMP BODY

A NEWCOMER in the field of commercial vehicles is the Motor Conveyance Co., of Milwaukee, which is building a line of trucks ranging in size from 3 to 10-ton capacity. To emphasize the manufacturers' good opinion of their product, the trucks are marketed under the trade name of B. O. E., as an abbreviation of the words, best on earth.

The personnel of the new firm includes Charles F. P. Pullen, cashier of the German American Bank, who was made president; the secretary and treasurer is Frank M. Davis, president of the Davis Mfg. Co.; I. W. Davis, superintendent of the same company, was made vice-president; and the sales manager is G. B. Lauderbach, formerly general sales manager of the Buckeye Mfg. Co., Anderson, Ind. Factory facilities have been obtained which will permit an output of 300 heavy trucks the first year.

First Truck Delivered

The first truck, of 6-ton capacity, has been completed and delivered to Durbin & Burke, contractors of Cleveland, where the truck is to be used in hauling brick for road work in Cayuga county. The specifications of this 6-ton truck show the mechanical features of the new line of commercial vehicles.

The four-cylinder motor is of the four-cycle type and has an exceptionally long stroke compared with the diameter of the cylinders, the dimensions being $5\frac{1}{4}$ -inch bore and 8-inch stroke. The cylinders are cast in pairs with the waterjacket integral. The valves are located in the head and are set at an angle of $52\frac{1}{2}$ degrees, as indicated in Fig. 3.

The lubrication is obtained by means of a gear pump, by which the oil is forced to a pressure chamber, and from this chamber it is distributed by lead pipes to all bearings. All the oil leads are attached to the inside of the motor, except the one pipe which carries oil to the indicator on the dash. An oil reservoir with a capacity of

5 gallons is supplied on the trucks built by this concern.

The radiator is located behind the driver's seat and a blower fan attached to the flywheel drives cool air through it. The thermo-syphon system of cooling is used and the water pipe to the heads of the cylinders passes through the seat to the left of the driver. Ample means of protection is from the heat of the motor and cooling water is provided for the driver.

A double system of ignition is employed, one set of spark plugs being supplied with current by a magneto driven by a cross-shaft from the motor, and the other set by batteries. A float-feed type of carburetor is installed on the right side of the motor and the throttle and spark control levers are located under the steering wheel. The normal speed of the truck is 10 miles per hour, and the maximum speed of the motor is 600 revolutions per minute, as controlled by the governor. A selective type of gearset giving three speeds forward and one reverse is operated by a lever at

the right of the driver. The other lever operates the emergency brakes, while the service brakes are brought into play by a pedal. The latter brakes are of the contracting band type, 4 inches wide and working on a 14-inch drum. The emergency brakes are of the expanding type 5 by 20 inches in size.

Transmission of Power

Power from the engine is transmitted through a multiple-disk clutch to a countershaft, from which final drive is obtained through side chains to the rear wheels. Both front and rear springs are semi-elliptic, the rear ones being equipped with auxiliary cross springs to carry the overload as shown at A in Fig. 5. The sturdiness of the construction of the solid rear axle and the spring fastenings also is shown in this illustration.

In Fig. 2 is illustrated at B the flexible strut rod to take the strain of propulsion and also to permit of taking up any looseness in the driving chains by means of the turnbuckle. It will be noted that the strut

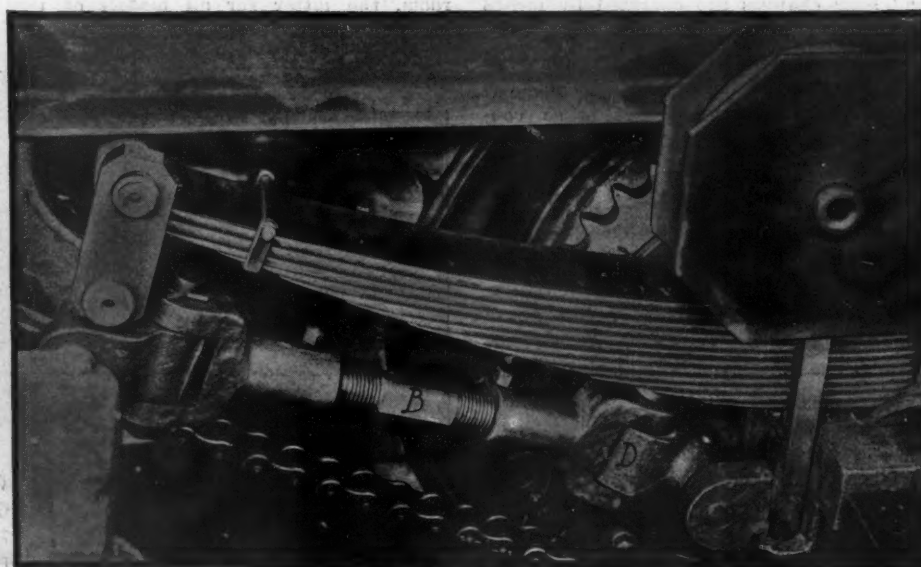


FIG. 2—SHOWING THE FLEXIBLE STRUT ROD OF THE NEW TRUCK

Products of Milwaukee Firm

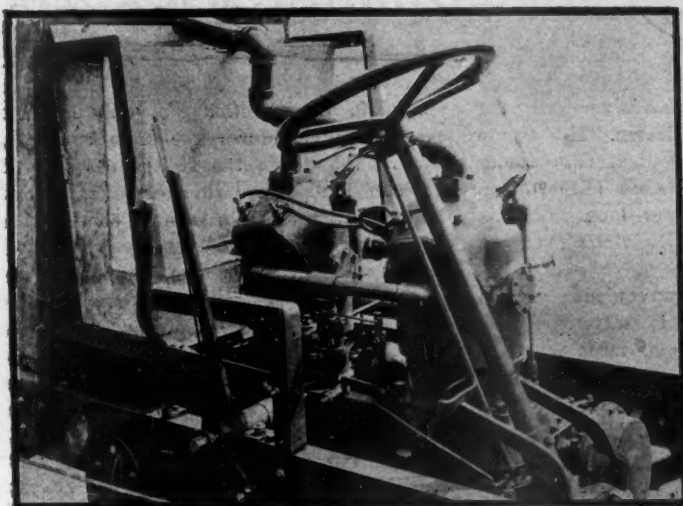


FIG. 3—VIEW OF LEFT SIDE OF B. O. E. MOTOR

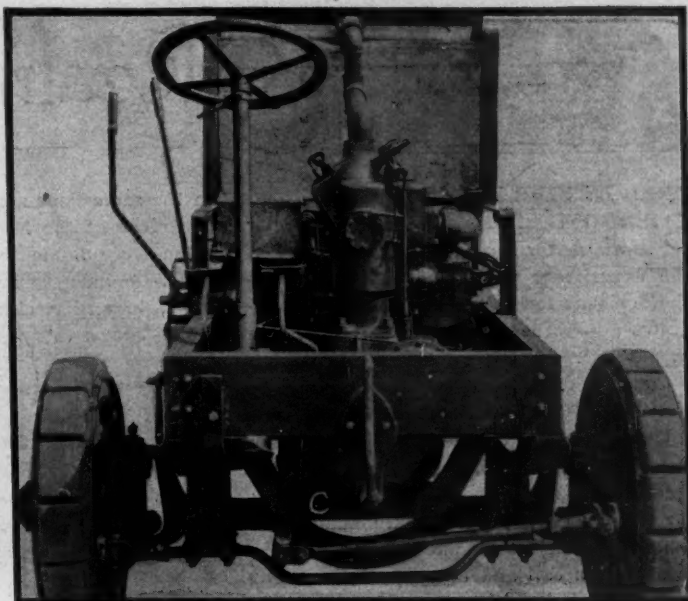


FIG. 4—B. O. E. TRUCK FROM THE FRONT

rod is attached to the frame and axle by means of universal joint D at the end, permitting a movement in any direction.

The motor is carried on a dropped cross member of the frame, as shown at C in the front view, Fig. 3. The rectangular front axle is dropped and is provided with exceptionally large yokes. The steering arm is carried across the front of the car to the left knuckle and the tie rod is dropped to correspond with the axle.

The frame consists of a steel channel 8 by 3 inches in size. The front wheels are 36 inches in diameter and have single block tires 6 inches in width, while the rear wheels are 4 inches larger and are equipped with dual block tires. The type of body fitted is optional. The body shown in Fig. 1 is a dump body operated from the motor by a chain and winch.

BRUSH PROMOTES ECONOMY TEST

Remarkable economy of operation and reliability of performance was shown in a national 100-mile economy test of Brush

runabouts conducted in all parts of the country on July 4. According to bulletin reports, telegraphed from the principal points where tests were held, the simultaneous running of a great number of cars under identical rules and conditions evolved a winner with a performance of 48.4 miles per gallon of gasoline, which is higher than any miles-per-gallon figure on record, it is claimed.

This showing was made in Los Angeles, Cal., by Y. R. Del Valle, who used only 2 gallons and $\frac{1}{2}$ pint of gasoline in covering 100 miles. Thirty-two of the contestants, who telegraphed the observer's reports to the contest headquarters in New York, averaged 18.9 miles per hour with an average gasoline consumption of 25.9 miles per gallon.

A. D. McClellan, of Oakland, Cal., who used 2 gallons, 1 quart and $\frac{1}{2}$ pint, made the second best showing. Several Brush dealers, including John Moore & Co. of 2008 Broadway, New York, approximated

the winner's score and made highly creditable runs. While the complete scores have not been reported in detail, they will be made public after being authenticated by the observers. Each competing car carried an observer who was either an official or appointee of a recognized motor club, or a disinterested person designated by city officials. In some cases, the dealers invited their own competitors to act as observers.

Economy of lubricating oil was equally as good as the low consumption of gasoline. John Moore & Co. of New York, and R. J. Hunt of Trumansburg, N. Y., each covered 100 miles on $\frac{1}{4}$ pint of oil, equivalent to 3,200 miles per gallon.

BAY STATE'S INCREASE

The first 6 months of 1911 show an increase of 13 per cent over the entire year of 1910 in receipts from motor vehicles by the state of Massachusetts. The total receipts for the last year did not quite reach \$375,000, while up to July 1 this year the total is now \$402,524.42. This is some \$90,000 more than the first 6 months of 1910. Some idea of the wonderful strides that have been made in 5 years in the Bay State motor industry may be gleaned by the figures for each of the years from 1907 to the present, as compiled by Chief Clerk O'Hara, of the Massachusetts highway commission. For 6 months in 1911 the total receipts were \$402,524.42; for all of 1910, \$374,038.25; 1909, \$169,973.54; 1908, \$121,488.50; 1907, \$92,096.56.

TRYING OUT SELF-STARTER

Motoring 1,000 miles without touching the crank, although marooned for 8 hours in mudholes in Missouri and encountering some of the worst roads in the country, is the record made by H. W. Melenbacker, who arrived in Kansas City July 8 from Grand Rapids, Mich. He was on the road 7 days. The trip was made in a Stoddard-Dayton equipped with a starting device patented by G. Michaels, of Grand Rapids.

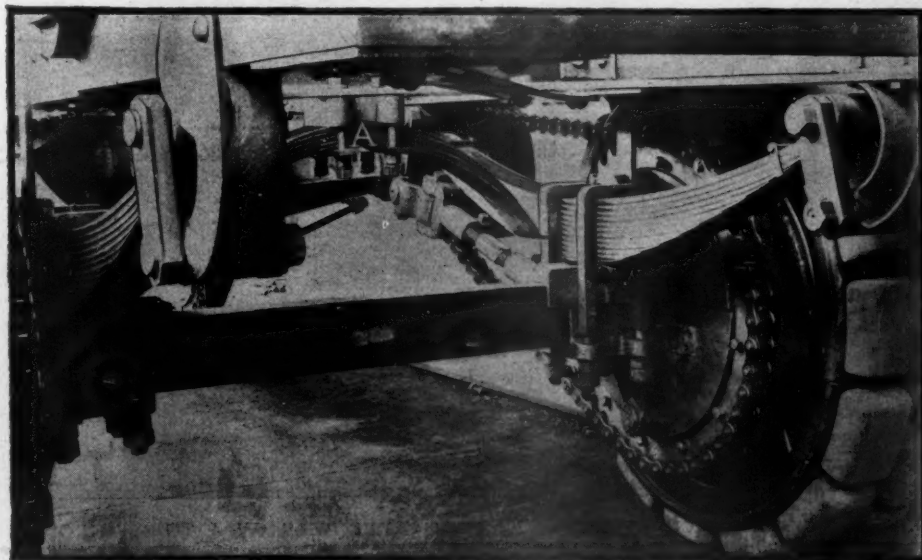


FIG. 5—REAR AXLE AND SPRING CONSTRUCTION OF 6-TON TRUCK



The Realm of the Commercial Car

FIGURES FIRE-FIGHTING COST

SPRINGFIELD, Mass., was the first city to use motor fire-fighting apparatus and the experiment proved so successful that the commissioners are replacing horse-drawn apparatus with motor driven as fast as possible.

Captain A. H. Strong, of Hose Company No. 7, Springfield, who has had charge of a Knox chemical engine ever since it was installed 3 years ago, has kept an accurate account of cost of both horse and motor car and also the proportionate number of times each has been immediately available to answer a call and is enthusiastically in favor of motor-driven fire apparatus. He says:

"For the 2 years and 9 months the Knox chemical engine has been in service, the entire cost of upkeep has been \$385.60, which includes tires, repairs, gasoline, oil and batteries. Of this amount \$315 has been for tires. The car has made 398 runs and the runs average about two miles. The reason our tire cost is so great is that we contract for tires by the year. In the 398 calls there were but five times when the car was not immediately ready; however, we were never delayed longer than five minutes.

"The cost of keeping a horse in a fire house in Springfield is \$240 a year, which includes feeding, shoeing and ordinary expenses, but does not include wear on floors and stables, caused by the sharp calks of the horses' shoes. Neither does it include plumbing, maintenance of harness or apparatus, nor depreciation of horses. The first cost of a fire horse is from \$250 to \$300 and the average life is 5 years. Besides, there is an exercise wagon which, while costing comparatively little, requires space in the engine house. There is about 1 hour each day when horses are not available for quick response to fire alarms on account of being out exercising.

"Each team requires a man, at a cost to the city of \$1,095 a year. This man is not available for fire-fighting, as he always must be with his team.

"Summing up the comparative cost: A horse-drawn chemical engine in 2 years and 9 months cost in round numbers \$5,000 to maintain as against \$385 for the motor chemical and our chemical hardly has the new worn off yet. In estimating the yearly cost of the horse-drawn engine, the driver's wages are included, because the driver is not and cannot be, a fire-fighter, while the driver of the motor chemical engine is a fire-fighter.

"Equipment can be increased without additional cost of buildings, as two pieces of motor apparatus will be accommodated

in the same floor space as is necessary for one piece of the horse-drawn. Horses are much more liable to accident than motor car and in a sudden sleet storm, deep snow, hills, icy going, or long runs the motor shows to great advantage over the horse.

"The comfort and convenience of the firemen is not a small matter. Where horses are, flies, fleas and mosquitos are also, and as firemen cannot be hampered with screens this phase of the fireman's life is worth consideration."

SALT LAKE HAS ENGINE

Salt Lake has just received its new motor fire engine. In the trials, the pumping mechanism, propelled by the flywheel disengaged from the clutch, threw a stream of 850 gallons per minute a great deal further than any steam engine in the service is capable of doing, and far exceeded the specifications in the contract. The engine has a wheelbase of 140 inches, and is 90 horse power. Of fire equipment it carries 1,000 feet of fire hose and 200 feet of chemical hose; two hand chemicals, life gun, a sealing and a roof ladder, and two suction hose, and five firemen including driver.

PROVE MOTOR SUPERIORITY

Some exceptional mileage and economy records are being established by two 48-horsepower and four 60-horsepower Winton six-cylinder cars on the Ashcroft-Soda Creek stage run in British Columbia, according to J. S. Reynolds, of the British

Columbia Express Co. Not only has the motor car cut down the time spent on the road between the two places from 2 days of hard travel to a daylight run of 12 hours, but the trip is more comfortable and less dangerous.

Early last summer the Canadian concern put two 48-horsepower cars on the run as an experiment. So successfully did they do the work formerly performed by horses and coaches that the company has added car after car until it now has six cars in the service.

Operating twice a week between Ashcroft and Soda Creek, a distance of 167 miles, from May 1 until October 31, the six cars are piling up an enormous mileage total. At Soda Creek the motor stages connect with the British Columbia Express Co.'s steamboat for Quesnel and Fort George, but not infrequently the motor cars continue on through to Quesnel, a run of 220 miles from Ashcroft. They carry passengers, mail, express, and fast freight.

That the roads that the motor cars called upon to traverse are far from being



N. A. G. MOTOR COACH USED FOR TAKING SIGHTSEERS ON A TOUR THROUGH BERLIN, GERMANY

in the class of boulevards is clearly shown by the fact that after going about 40 miles an elevation of 900 feet above sea level is attained. The highest elevation reached is 4,300 feet. The roads, for the most part are steep and rough, the grades in many places running from 10 to 15 per cent. Careful driving is absolutely imperative, for there are numerous sharp turns where the variance of a foot from the established route of travel means a dash to death over a precipice. Forty-seven miles out of Ashcroft is located Fifty-nine-mile chasm, probably the most precipitous piece of road within a radius of 100 miles. It droops off a sheer 900 feet.

REPLACES THE OLD STAGE

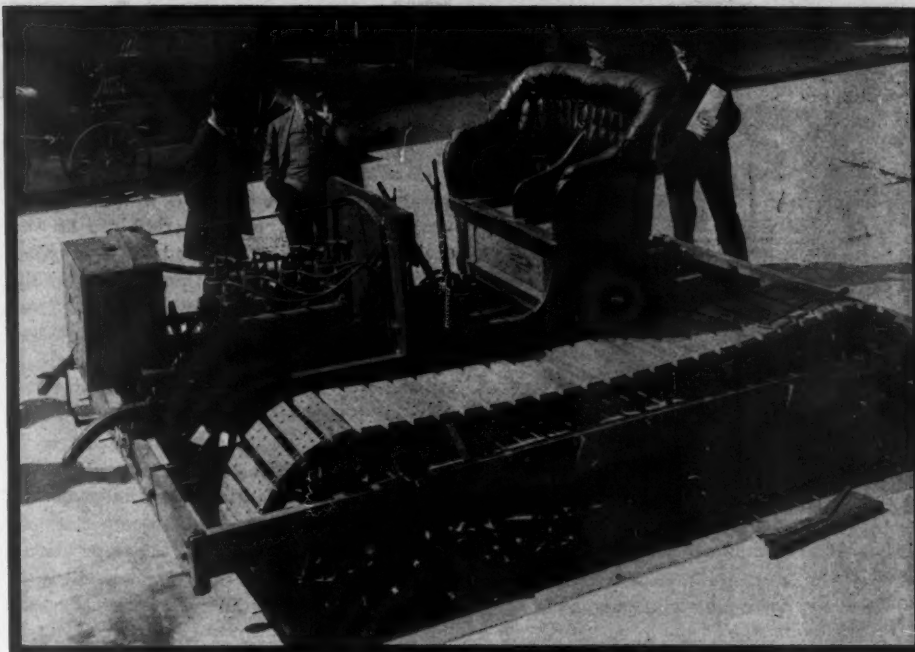
How commercial history, as well as its political counterpart, repeats itself has been aptly illustrated in California where the old stage coach line, for many years considered an obsolete institution, has been reincarnated. Only this time instead of the six sturdy horses hauling a rattling omnibus over the long roads, there are six powerful cylinders which propel a pneumatic-tired vehicle up hill and down at a faster pace than the old stage coach drivers ever dreamed of.

The new stage route service has been opened between Kernville and Caliente, Cal., a distance of 45 miles and a Mitchell 50-horsepower six-cylinder car is the stage. An idea of the work it has to do may be gained from the statement that though the road has a good surface the grade averages 15 per cent. In making the run the car climbs from an altitude of 1,700 feet to one of 6,000 feet in a little less than 40 miles. The car carries seven passengers and has an extra large platform in the rear for carrying baggage. On account of the grade the motor car makes the trip in a third of the time required by a team of horses.

HOT WEATHER A TEST

The terrific heat of last week, when the thermometer went above 100 on several days, gave the Boston motor truck dealers an opportunity to prove the value of motor vehicles over horses. A Buick truck was being demonstrated along the north shore during one of the hot days, and it passed three wagons, the horses of which had dropped dead from the heat. One of the big ice companies had more than 100 horses unfit for service, and another company could only work its horses every other day. This resulted in thousands of people being deprived of ice at a time when it was badly needed. The same situation was true of the milk dealers, who could not meet the demand, causing untold suffering among the people.

Other big houses in Boston who still use horses lost thousands of dollars because the animals were dropping dead or being taken ill. The men who had motor vehicles, on the other hand, were able to carry out their schedule on regular time, and so found the trucks a paying investment. The motor ambulances of the Boston hospitals were



CATERPILLAR MOTOR CAR BUILT FOR USE IN ALASKA AND THE FROZEN NORTH

worked day and night and they proved a blessing in bringing victims to hospitals in time to save their lives. The death rate for the week went to 375, or about 100 above the average, and had it not been for the motor ambulances these figures would have been much larger, because the horse ambulances were put out of commission early.

It was an admirable object lesson to the business men of Boston and vicinity, and it should create a boom in trucks showing their adaptability for service, more particularly under adverse or extraordinary conditions.

PROTEST AGAINST AWARD

Members of the Baltimore Automobile Dealers' Association have protested to the board of awards against the specifications for a motor car for the city engineers' department. The dealers claim that the specifications are unlawful in that they do not permit competition for the contract. This was due to Mayor Preston's stand to the effect that he wanted the specifications prepared so a Baltimore made car would be secured. In answering the complaint of the delegation of dealers, Mayor Preston said that his idea was to encourage Baltimore industries and also to bring motor car factories here by such encouragement. Should the mayor be upheld by the board of awards and the board of estimates in his stand it would seem that the Spoerer car would be the one selected, as it is the only one manufactured in Baltimore.

THE CATERPILLAR MOTOR

A caterpillar motor car, built for use in Alaska and the frozen north, which will tread the Arctic snows and tow sled loads



of foods and supplies in the Candle district, trod the vitrified brick pavement at Seattle on the way to the Alaska Steamship Co.'s dock, where it was put on board for transfer to Alaska.

The machine is built from the body of a motor car to the order of Charles Dankert of Candle, Alaska. Dankert, who has spent 20 years in Alaska, plans to run a motor freight over the snows into Candle. The Emery Machine Co., of Seattle, built the car.

On either side of the car in place of wheels is an endless chain of wooden treads. These treads are designed to walk over soft snows where wheels and tires would sink and stick. Each belt or chain of treads is about 3 feet wide and capable of sustaining the car in the softest snow or mud. In order to steer the apparatus each side is under separate control so that one belt can be stopped while the other carries a car around the corner. In addition to this there will be a long tail-like rudder with a similar tread which will project behind and help turn the car.

FARMER MAKING TESTS

Tests of the practicability of using gasoline as power for the operation of farm machinery are now being made on the farms owned by A. S. Lewis, the millionaire cattle raiser of Geneva, N. Y. He proposes to use gasoline power for plowing, harrowing and other work that has been heretofore done with horsepower. In the first tests the motor proved too light for the heavy work, and an investigation is now being made to determine if the gasoline motors of the heavier type are sufficiently durable to warrant the relatively large investment. Mr. Lewis has been sending cargoes of peas raised on his farm to a canning factory in wire crates upon a motor car from which the body had been removed.



"KEEP THE TIRES INFLATED TO THE PRESSURE RECOMMENDED BY THE MAKER FOR TIRES OF YOUR SIZE"

A striking commentary on the role played by the tires on a motor trip was furnished by some observations made on the return from the Algonquin hill climb a few weeks ago. During the run back to Chicago in the evening twelve cars were passed drawn up at the side of the road on account of trouble. Of these twelve cars, ten were stopped for the repair of tires.

In most instances the drivers seemed to be supplied with either spare tubes and casings or tire repair outfits and were going ahead with the replacement or repair with a nonchalance that suggested that such trouble was to be naturally expected. In a few instances, however, the masculine portion of the party was hailing every passer by and frantically asking for tubes or casings, of a size to fit the tires, while the feminine contingent was sitting by the side of the road with faces expressive of profound disgust.

Just an Example

The most flagrant case of tire trouble was that of a party of five which started out for Algonquin from Chicago early in the evening of the day before the contest. Six or eight spare tubes were carried, but no outfit was provided for repairs. The party was delayed for an hour before the limits of the city were reached by an arrest for speeding. The entire night was spent on the road, most of the time being occupied in changing and inflating tires. The air bottle was emptied before half the distance to Algonquin was covered and the hand pump had to be brought into service. After consuming the whole night in driving less than 50 miles, the worn-out motorists arrived at their destination about 6 o'clock in the morning in no condition to enjoy the event of the day.

The return trip in the evening was no more fortunate, for the remaining spares were used up and the pump worn out before the party was half-way home, and it was only through the kindness of the occupants of a passing car that the unlucky travelers were enabled to proceed. One of the party was taken to a nearby village where tires were ordered by telephone from the city and a lunch procured for the marooned

ones wearily fighting sleep and hunger by the roadside.

It is almost inconceivable that the right kind of preparation would not have prevented the most of the trouble. If the casings and spare tires had been in good condition at the start there would probably have been little difficulty. A thorough inspection of tubes and casings before the trip was made would have avoided all the wearisome delays and would have prevented the transformation of a short pleasure trip into a veritable pilgrim's progress.

Yet it is possible that tires and casings were really in good condition at the beginning of the trip and that a nail or sharp stone or the like was picked up at the time of the first puncture. If the cause of the original trouble were not removed it would, of course, cause succeeding punctures as long as it remained. Very often the object becomes imbedded in the casing in such a way that it is very hard to locate on examination, making its presence known only by piercing the tube when under pressure on the road. It can usually be found by running the hand around the inside of the casing and bearing down hard on the latter.

Keep the Tires Inflated

Those who have anything to do with the selling or repairing of tires are continually harping on the same strain—keep your tires inflated—and with reason. Tire manufacturers say that the greater proportion of tire troubles are due to insufficient inflation alone, the estimate of the different makers placing it between 60 and 90 per cent. It is not necessary that the tire be flat to result in damage to it. The side walls of the casing are usually the thinnest part of it and it is here that the bending and wearing is the worst if the car is run with the tire partially deflated. This causes the fabric to break and tear along the sides, the beads are torn away, the walls are scraped and scored both on the outside and inside, and the canvas breaks away from the rubber.

Naturally, when the tire is completely deflated so the rim rests on the ground the effect is much worse, and any running on the tire in this condition results in grave injury to both tube and casing. Not only is the casing badly rim-cut, but the tube will be found to have a series of cuts all the way around it. Often there are two rows of cuts where the rim has ridden on the double thickness of the flat tube. These cuts are not always sufficient to cause an immediate leakage of air, but always so weaken the tube that leakage soon develops. When a blowout or puncture so bad that it cannot be immediately repaired occurs, the tire should be removed and a length of rope wound around the rim, in case there are no spares. While

MOST of the tire trouble is due to insufficient inflation.

The tire need not be flat to damage it.

Running on soft tires causes fabric of casing to break and tear along the sides and the beads to tear away.

Driving with flat tire is worse in that the tire is ruined more quickly.

A few blocks on a flat tire will cause rim cuts in casing and tube.

Do not run on the rim, as this bends and roughens it so that the next casing will be ruined.

When a tire gets flat remove it and wrap a rope around the rim till a new tire can be put on.

Use a gauge to tell tire pressure. You cannot rely on the feel or appearance.

If the car is not to be used for some months jack up the wheels and partially deflate the tires.

Take care of the spare tubes and casing.

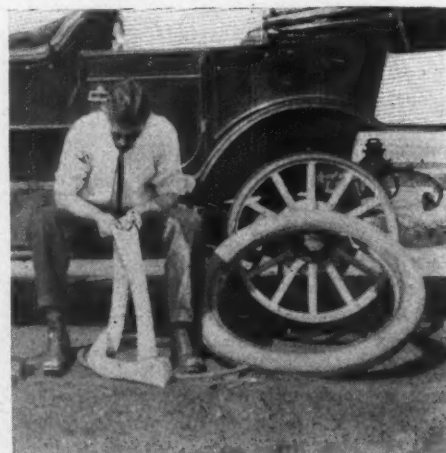
Do not carry tubes loose in the tool box. Put them in a tube bag.

Keep a dark cover on the extra casings.

running on the bare rim is preferable to running on a flat tire, the former is almost sure to damage the rim to some extent by contact with the road surface. A rope can be made to act as a substitute for the tire for a short distance without injury to the rim.

Proper Inflation the Keynote

Proper inflation is the keynote of tire service. Manufacturers of tires publish tables showing the proper inflation pressure for their tires and they should always be kept at the pressure indicated by them. The pressures recommended by the makers are for average loading, but should the car be overloaded, the pressure should be



"TO BEGIN WITH, CAREFULLY EXAMINE THE TUBE ALL OVER. IT MAY BE LARGE ENOUGH TO BE SEEN"

Care Means Mileage

RUBBER tires have four natural enemies—light, heat, oil and water. Light and heat affect the rubber chemically. Oil rots the rubber. Water rots the fabric.

Keep iron rust off the rims, as it rots the canvas. Paint the rims with shellac or graphite.

Casings wear badly if wheels are not parallel or if the steering connections are loose.

Careless driving is responsible for tire trouble. Quick starts and stops put too sudden strains on tires and cause casings to wear.

Skidding, especially turning corners at high speed, destroys rubber and fabric.

Brakes out of adjustment make one tire wear too much.

Bad cuts in casings should be vulcanized.

Fill small cuts immediately with a plastic filler.

Carry spare casings and plenty of extra tubes.

Tire changes are unavoidable, but roadside tire repairs are the mark of a novice.

increased. If the car is heavily overloaded it is economy to fit larger tires. Such a change is made possible by the fact that most rims will accommodate tires of larger sizes than those at which they are scheduled. For instance, it is possible to put a 35 by 4½-inch tire on a 34 by 4-inch wheel. The result of this is that a larger tire is obtained which will stand a good deal more road use than a smaller one will.

Use a Pressure Gauge

Many motorists believe that they can tell when their tires are properly inflated by observing the extent to which they flatten on the road. A tire may look round under load and yet have only half the required pressure. No amount of ex-

ternal observation, feeling or kicking the outside of the tire tells the pressure on the inside. The only way of accurately determining the tire pressure is by the use of a tire gauge. One of these instruments will more than save its cost in repair bills in a surprisingly short time.

When the car is used regularly the tires should be fully inflated at all times, but if it is not used for some months it is better to jack up the car and partially deflate the tires, as the continued strain on the walls of the casing is relieved.

With clincher rims, if the tire is not properly attached the inner tube is almost sure to be pinched, that is, caught between the casing and the retaining stud or between the casing and the rim. The portion of the tube near the place where it is caught is stretched and strained, causing the tube to tear or burst. Likewise, the casing may be damaged if it is not caught properly between the rim and the stud. The inner tube may even blow out through the space between the casing and the rim.

Look Out for Spares

One thing to which the average motorist pays too little attention is the protection of his spare casings and tubes. Casings should always be provided with covers—preferably black, or of some other dark color, as sunlight causes the rubber to deteriorate. Provide a tube bag to carry the tubes in and never carry them loose in the tool box. Rubber tires have four natural enemies, light, heat, oil and water. Light and heat affect the rubber chemically, causing it to harden and lose its strength and elasticity very rapidly. Oil will rot the tire more quickly than anything else. When oil gets on the tires it is best removed with gasoline. The practice of allowing the car to stand in puddles of oil helps to keep the tire factories busy.

Water rots the canvas in the casing and tends to soften the rubber to some extent. When workers in rubber wish to cut it they wet either the rubber or the knife, finding that rubber cuts many times easier than when dry. For the same reason rubber tires are more easily cut when wet, so that it behooves one to be very careful when driving over muddy or wet roads.

Canvas is very easily rotted by iron rust and water therefore should be kept from reaching the inside of the rim. If the rim is clean and free from rust, as it should be when the tire is put on, it may be kept in that condition by keeping the retaining bolts and the lock nuts of the valve stem drawn tight so water cannot work through the holes in the rim. Dry the tires after washing or after a run in the rain. If the rim has rusted, the rust should be removed with emery cloth and the rim painted with a light coat of shellac. Graphite paint also is recommended but stove polish makes an excellent substitute. If the rim is



"BLOWOUTS OCCUR WHEN THE FABRIC OF THE CASING HAS BEEN CUT OR WEAKENED TO TOO GREAT AN EXTENT"

dentured or the edge is roughened, it should be straightened and the rough edges filed down.

Casings wear badly if the wheels are not parallel. With wheels in this condition one or both of them are always running at a slight angle to the direction of the car. This causes the tire to be dragged along to some extent instead of rolled along as it is supposed to be. To determine whether or not the wheels of the car are in correct alignment measure between the felloes of the wheels or the edges of the rims at a point directly in front of the front axle. Make a similar measurement at a point opposite from where the first measurement was taken. The difference between the two measurements is the amount by which the wheels are out of true. Loose steering connections also will cause wear of tires.

Careless Driving Often Responsible

Careless driving is responsible for a great deal of the tire trouble. Many operators of cars think they are displaying their skill by quick starts and stops and taking corners at high speeds, but it is rather a mark of ignorance than proficiency, and a very expensive method of demonstrating ability. Not only does it wear off the rubber surface of the tire, but is very sure to strain the inner fabric. Throwing in the clutch quickly with a sudden jerk makes the strain of the start on the tires come as a sudden blow rather than as the steady pull for which they were designed. In the same way a harsh application of the brakes wears out the rubber surfaces if it is sufficient to cause skidding. If the car is run with the brakes out of adjustment one of the bands will hold tighter than the other and cause one of the casings to take up the most of the strain in stopping the car. This will result in greater wear on the casing.

It will be noticed that the tires get hot after a fast run of any great length. This is due in large measure to the heat generated by friction between the casing and the inner tube. The application of French chalk or powdered soapstone will lessen this friction, which always is re-



"FOR TEMPORARY REPAIRS USE A BLOWOUT PATCH ON THE INSIDE OF THE CASING AND TIRE TAPE OUTSIDE"

accompanied by wear between the rubbing surfaces. If too much powder is used, however, it may form into lumps and do more harm than good.

Locating Punctures

Novices sometimes have difficulty in locating very small punctures in tubes. One of the tire manufacturers suggests several methods which are valuable. To begin with, carefully examine the tube all over. The hole may be large enough to be seen under careful examination. On the other hand, the hole may be a mere perforation, made by something as small as a needle point. This will require different procedure. Inflate the tube slightly but not enough to cause much swelling in the surface of the tube. Then hold the tube near the ground if it is dry, turning the tube around until the disturbance in the dust proclaims the escape of air. If this test fails, hold the tube near the cheek and the escape of air may be felt. When the puncture is too small for either of these tests, the only recourse is to immerse the tube in water; the point at which the bubbles rise from the tube is the point of trouble. If the tube itself shows no leaks, it is a good sign that the valve is at fault. This can be tested by holding the valve in a glass of water with the valve pointing down.

In patching inner tubes, carefully clean the rubber around the leak with gasoline so as to remove all the dirt. Then clean the patch in the same way. For the smallest puncture a patch about 2 inches in diameter should be used and for larger holes the patch should extend at least $1\frac{1}{2}$ inches beyond the edges of the puncture. After patch and tube are cleaned with gasoline, rub up the surface with coarse sandpaper. A patch may be cut from an old inner tube, the corners rounded and the edges carefully beveled off, but it is better to use the prepared patches supplied by tire makers. Cover the patch and the cleaned spot on the tube with a thin coating of rubber cement and allow it to dry. Then apply a second coating and when it has dried press the patch on firmly. Care should be taken that the patch is firmly attached to the tube at the edges. Allow the cement to set about 2 minutes before pumping air into the tube. Manufacturers of tire cement usually issue instructions for its use and if these are followed little difficulty will ensue.

Patches Not Permanent

The ordinary cement patch does not make a permanent repair, as it is liable to work loose when running at high speed. The tube should be vulcanized as soon as possible. If proper care is exercised, permanent repairs can be made by acid vulcanizing, but the safer method is to send the tube to a competent repairman for vulcanization. There are on the market several kinds of plastic fillers with which the holes in the tube may be plugged up and which make very good temporary repairs. A nail or long tack often penetrates the tube in two places, especially if the tire is partially deflated when the puncture

occurs, necessitating a double repair. In repairing a punctured casing, the hole can be covered by applying to the inside a piece of prepared canvas, which is supplied by the manufacturers. The procedure is like that of repairing a tube. Small cuts in casings should first be cleaned out thoroughly with gasoline and if there are any bits of dirt or stone in the cut they should of course be removed. The easiest way of applying the gasoline is by means of a rag wrapped around the end of a pencil. Hold the edges of the cut open until it is dry and then cover the inside of the cut with cement. When this is dry, knead in some plastic filler and press the edges of the cut together. Then let it dry over night.

Repairing Casings

For a roadside repair of a cut that goes clear through the casing, fit on the inside of it a strip of canvas long enough to catch between the bead and the rim. To prevent its creeping, it is well to cement the strip to the casing for at least a portion of its length. If you are supplied with a blowout patch or tire sleeve these should be used instead.

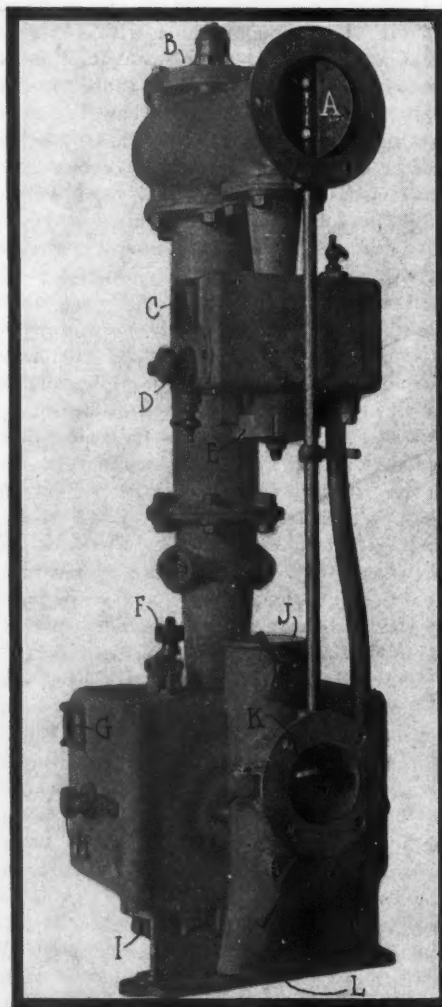
Blowouts occur when the fabric of the

casing has become cut or weakened so that the pressure of the air in the tube under the weight of the car becomes too great for it. For temporary repairs use a blow-out patch on the inside of the casing and wind tire tape around the outside or put on a boot. The tire should be sent to the maker or a competent repairman as soon as possible for a complete repair.

Although the methods of making roadside repairs of tires were gone into thoroughly, a roadside tire repair nowadays is considered the mark of a novice. A supply of spare tubes and an extra casing will obviate the necessity of making repairs on the road and always should be as regularly a part of the equipment of the car as the pump or jack. Another thing that should not be forgotten is a supply of tube patches, blowout patches and tire sleeves for use in case of emergency.

At the end of a run wash off the tires with a damp cloth and examine them carefully for cuts or blisters. Cuts should be immediately repaired as outlined above and sand blisters and mud boils should be punctured and cleaned out and then bound with tape till it is possible to have the tire vulcanized.

Largest Gasoline Carbureter Ever Made



A CARBURETER 5 FEET HIGH—STROMBERG DESIGN FOR SELF-PROPELLED GAS-ELECTRIC RAILWAY CARS

WHAT are said to be the largest carbureters ever constructed for use on gasoline motors have been recently made by the Stromberg Motor Devices Co. of Chicago. One of these is illustrated here. It stands nearly 5 feet high and was designed for use in connection with an 8-cylinder motor delivering nearly 170 horsepower at 600 revolutions per minute.

Twelve of these immense carbureters have been built for the General Electric Co. for the motors of gas-electric self-propelled interurban railway cars. Reference to illustration shows the construction of the carbureter. It will be noted that the carbureter really is two carbureters in one, the upper one for low speeds and the lower and larger one for high speeds. The rectangular portion at the bottom is the reservoir and mixing chamber of the high-speed carbureter, while the smaller one above is the low-speed carbureter.

At high speeds both are delivering gas to the manifold at the top, where it is supplied to the intake pipes through the throttle valve A. The level of the gasoline in each reservoir is maintained practically constant and may be seen in the gauges C and G. The flow of gasoline is adjusted at H in the large, and at D in the small reservoir. The admission of air to the smaller carbureter is regulated at E, while there are four separate entrances for air to the high-speed vaporizer; an automatic air valve I, a free-air intake controlled by a valve J, a hot air intake K and an auxiliary crankcase intake at L. The automatic gasoline valve is adjusted at F.

The Motor Car Repair Shop

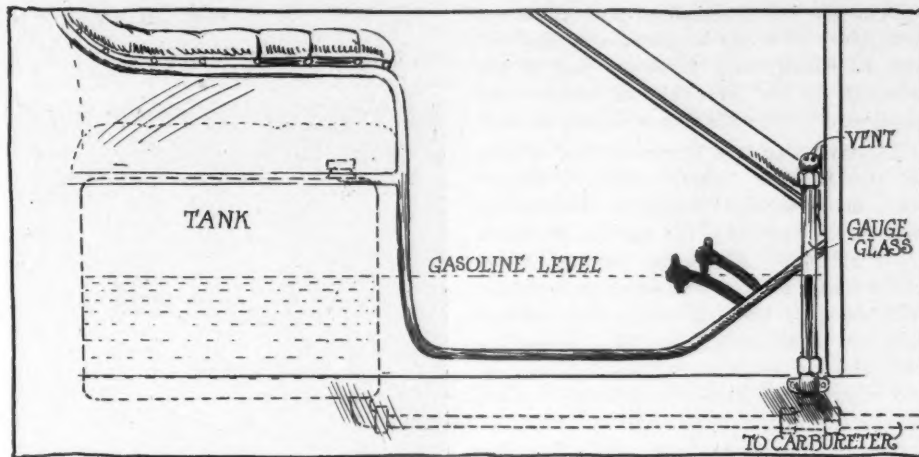


FIG. 1—SHOWING HOW A SIMPLE GASOLINE GAUGE CAN BE FITTED TO THE CAR

Hidden Nail in Tire

"It never rains but it pours" oft has been the weary expression of the motorist after having replaced three or four punctured tubes in the same tire within the course of a few miles. One often hears among the hard luck stories that the motorist is wont to tell, of cases where a reserve supply of five or six extra inner tubes was used in the same tire before the car had completed a 50-mile run, and how all of the punctures occurred within perhaps the last 10 of the 50 miles; or, where a single tube was repaired eleven times in a run of about 200 miles. These are very ordinary cases, but they will serve very well to bring out an important point about punctured tires that may save the motorist from considerable annoyance.

It often happens that a tire is punctured by a nail or piece of wire or glass, which becomes imbedded in the casing as indicated in Fig. 2. The point of this nail will just be pushed up a little way against the tube each time the wheel revolves and thus succeed in wearing a little hole in the tube, allowing the air to slowly escape therefrom. Owing to the hidden position of the nail, a casual examination will not reveal it, and the unwary motorist either will replace the tube with another or repair it, only to find after a few miles of travel that the tire again is deflated. Therefore, when a tire has been punctured, it should be borne in mind that the cause of the puncture still may be imbedded in the casing, and every effort should be made to locate and remove it before the new or repaired tube is put back into the casing. The casing should be thoroughly examined inside and out. Often by carefully running the hand over the inside of the casing the point of the article that did the damage can be felt, and again, when unable to find the point of anything piercing the inside of the casing, one may be apt to find the head or end of a tack

or nail on the outside of the tire casing.

In Fig. 3 is shown how a loose control lever on the quadrant over the steering wheel of a car was tightened. The nut N

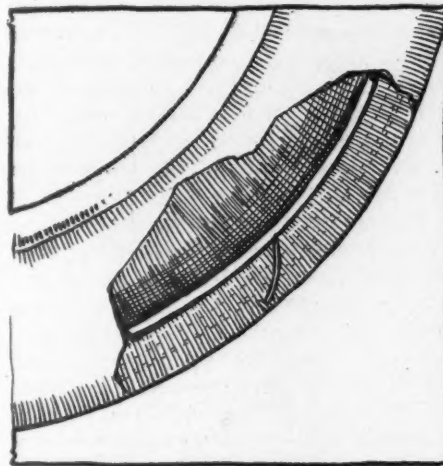


FIG. 2—A NAIL IN THE CASING

which is intended to lock the levers in place had come loose and allowed a little lost motion to take place between the lever L and the rod that passes down through the steering column. This lost motion caused the hole in the lever to become

enlarged quite rapidly so that the lost motion was greatly increased and began to be very annoying to the driver of the car, who then simply tightened down the nut several times, only to find that neither the nut nor the lever would remain tight for more than a day or so. The trouble then was brought to the attention of a repairman who removed the lever from the car, placed it on the anvil portion of the vice, struck it a few sharp blows with the hammer, as indicated in the illustration, whereupon, on refitting the lever to the end of the rod, instead of fitting loosely, it was necessary to force it on by tapping it into place with a hammer; the nut then was replaced, and the trouble eliminated.

Nowadays, on most cars, when the motorist desires to learn the amount of gasoline that is in the tank, it is necessary to have the occupant of one of the front seats get out of the car perhaps, remove the seat cushion, lift the seat cover, take the cap from the gasoline tank, then find a stick or screw driver or the like and lower it into the tank, so that from the depth from the cap to the gasoline, or from the actual depth of the fuel supply, the amount in the tank can be approximated. This seems very impractical, especially when it is possible to secure gauge glasses or other types of gauges, which, if properly installed, are absolutely gas tight and obtainable at a most reasonable price. A common ordinary water gauge, such as is obtainable at almost any engineer's supply house, a short piece of copper tubing about the size of the gasoline line, and a T or three-way connection, is all that is necessary to eliminate all of the above mentioned trouble if installed as shown in Fig. 1. The three-way coupling is used to tap the gasoline line between the supply tank and the carburetor, and a short piece of tubing is used between this coupling and the gauge glass, which can be secured to the dash or side thereof at a height that will indicate at a glance the depth of the gasoline in the tank.

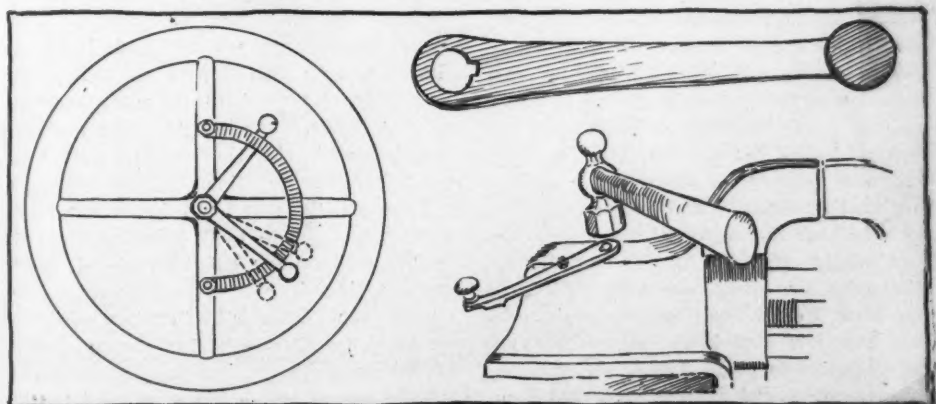


FIG. 3—SHOWING METHOD OF TIGHTENING ENGINE CONTROL LEVER

From the Four Winds



NEW KIND OF SIGNBOARD USED IN REDLANDS, CALIFORNIA

LABOR Day Meet Off—The Indianapolis speedway has withdrawn its application for a sanction for September 2 and 4, to which objection was made by the Chicago Motor Club, announcing that it did not wish to conflict with the national stock chassis road races which will be run at Elgin on August 25-26.

Prize for Road Makers—The Wisconsin State Automobile Association has hung up a prize to be awarded to the pathmaster whose stretch of road over which the second annual reliability tour will pass July 17 to 22 is considered best by a set of judges composed of officials of the tour. There is warm rivalry among progressive pathmasters in all parts of the state, for the competition for the good roads trophy was well advertised by the two trips of President M. C. Moore, pathfinder and pilot, over the route.

New Viaduct Ready—The new \$1,500,000 Grand avenue viaduct at Milwaukee, Wis., forming the principal western exit from the city, was finally opened to traffic on July 4. It was started in 1907 and the contract called for its completion in 1909, but was delayed so many times and so long that residents of Milwaukee had given up hope that the mammoth concrete structure would ever be used. The viaduct eliminates two dangerous hills leading to the Blue Mound road, on which is situated the new club house of the Milwaukee Automobile Club. Work on the construction of Grand avenue boulevard from the west end of the viaduct to the county

line is now being rushed to completion. A temporary exit has been made by improving Highbury place from the end of the viaduct to the Blue Mound road. The boulevard will be 150 feet wide and parked.

Electrics Can Use Wharves—The officers of the Electric Vehicle Club of Boston have made personal visits to the various owners of wharves in Boston to learn their attitude relative to commercial vehicles being sent on the wharves to transport freight, and the club has learned that no restrictions have been placed on any electric vehicles, although some of the wharves are closed to gasoline trucks, it was stated.

Columbus Club Growing—Since the Columbus Automobile Club, of Columbus, O., has moved into its new quarters in the Virginia hotel, at Gay and Third streets, arrangements are being made for considerable activity on the part of the club. One of the forms of activity will be a membership campaign which already has been launched. The club is receiving on the average of eighteen new members every week and it is expected to increase the rolls by 250 in the next three months. Arrangements are being made for an informal housewarming of the new quarters July 20.

Club at McKeesport—The McKeesport Automobile Club, of McKeesport, Pa., came into existence about 2 weeks ago. It is a mighty lusty baby, for already it has nearly forty members. Its officials are: President, George H. Lysle; vice-president, Dr. H. S. Van Kirk; secretary-treasurer, W. H. Douglas. The club has been so successful at the start that it is now proposed to extend its territory to take in Homestead, Braddock, Duquesne and other Monongahela valley towns in the Pittsburgh district, in which case the name will be changed to the Monongahela Valley Automobile Club.

New Kind of Signboard—A novel idea to prevent accidents at dangerous curves has been developed by City Engineer Hinkley of Redlands, Cal. There are some very dangerous railroad intersections at compound curves in that busy little city, and as there are many tourists in that part of the country who are unfamiliar with the thoroughfares, it was deemed wise to take all precautions against collisions and wrecks. Therefore, a crew was put to work painting lines of luminous aluminum paint at the difficult curves; broad and conspicuous bands which run down the center of the smoothly-paved streets for the guidance of drivers. At the intersection of three streets, one of which has a railroad track, there is a compound curve, and here the



SAMPSON TRUCK IN USE AS A LOGGER IN NEW HAMPSHIRE

line has been carried for about 300 feet, with arrows to mark where the vehicles are required to take their own side of the street and keep it.

Shriners Form a Club—A new club, to be limited in membership to 100 and called the Lu Lu Temple Automobile Club, has just been organized in the Lu Lu Temple Mystic Shrine. The new organization has in contemplation several novel and out-of-the-ordinary events and runs. Officers have been chosen as follows: President, Joseph Way; vice-president, W. C. Martin; treasurer, W. C. Burk; secretary, A. T. James; counsel, Bertram S. Rearick. Fifty motorists joined the first night.

California Statistics—Californians are spending \$50,000 every day in buying motor cars. The state registration bureau for motor vehicles at Sacramento shows that 3,556 cars were sold the first 3 months of this year, representing more than \$4,500,000 put into circulation by the motor-purchasing public in 90 days. In looking over the various makes of autos registered during the past few months in California one finds that 1,904 machines out of 3,556, or over 50 per cent, come from the city of Detroit alone, and that out of the total registration 2,117 cars were manufactured in the state of Michigan. The railroads coming into California, during the past few months, brought 884 carloads of motor cars, and at an average of over \$300 per car, the freight charges being over one-fourth of a million dollars. One enterprising dealer last year brought a

solid trainload of twenty-nine freight cars, all filled with one particular make of cars he handled. It would have taken nearly thirty such trainloads to represent the cars sold in California in January, February and March this year, and if these freight cars were all in one train it would be almost 7 miles long.

Truck as a Logger—In the New Hampshire hills in the vicinity of Nashua there is a lumber industry and a tract of timber land which, if not one of the greatest in New England, is representative of conditions which the motor truck must meet, and the results of a recent introduction of Sampson trucks are interesting and significant. The accompanying illustrations of the truck at work show the character of ground which was covered with a 4-ton load and it will be seen readily that the nature of the work, both as to conditions of travel and loading and unloading, is far different from that ordinarily performed by trucks.

Good Roads Decision—Michigan townships which issued bonds to pay for good roads previous to the adoption of the county road system under the act passed by the last legislature are entitled to a return of the county tax paid by their counties until the bonds are paid. This is the opinion of the attorney general furnished to the prosecuting attorney of Wexford county. Two townships in that county issued bonds in 1910 with which to build state roads. This spring the townships asked the county road commissioners for a return of their county road tax with which to make a payment on the bonds and were refused by the commissioners. The attorney general says, however, that as the bonds had been issued in good faith previous to the time the act of 1911 went into effect, the townships are entitled to the tax until the principal has been paid. A similar question has arisen in several other counties.

New League Formed—For the purpose of assisting the California state government in carrying out the project to establish highways throughout the length and breadth of the state, for which the expenditure of \$18,000,000 has been authorized, the motorists of California, at a recent meeting in Sacramento, formed the California State Highway League. P. J. Walker, of San Francisco, was elected president; Gilbert P. Beere, of Sacramento, vice-president; A. G. Briggs, of San Francisco, secretary; and A. J. Marsh, of Sacramento, treasurer. These with Secretary Hines, of the California Good Roads Association, of Eureka, and Dr. C. C. Dwight, of Merced county, constitute the executive committee. The state will, in this undertaking, according to the by-laws adopted by the league, get the benefit of all the data in the latter's possession. The league will, in addition endeavor

to harmonize any sectional differences that may arise in regard to the selection of the most proper and feasible routes for the proposed highways.

Novel Race Proposed—For a cash prize of \$100 given by the Mount Baker Club and a silver cup by the Bellingham Herald, a motor car and a locomotive will race to the top of Mount Baker in Washington on August 9. The motoring party will leave Bellingham in a machine and dismount at the end of the Deming trail, finishing the race afoot.

Home for Grand Rapids Club—The Grand Rapids Automobile Club, of Grand Rapids, Mich., after long deferred negotiations, has concluded the transfer of a 68-acre tract of land on the bluffs at Plainfield, 14 miles north of the city, to be used as a site for a new club house. The action was taken at a final meeting called for the consideration of the proposition of a consolidation of the Grand Rapids Automobile Club and the Highland Golf Club. The original plans called for including the Grand Rapids Curling Club into the consolidation, but members of that body decided not to enter the union, as did the

golfers. Immediately upon the edge of the village of Plainfield, the site rests upon a 100-foot eminence commanding a view of several miles up and down the Grand river.

To Stop Hangers-On—Legislation has been enacted in Toledo to prevent roller skaters and bicyclists from hanging onto motor cars and other vehicles. The practice has grown so common in Toledo that fatalities were frequent. The ordinance gives the officials power to stop the practice.

Willys Gives Employees Club House—J. N. Willys has presented a club house to the Toledo employees of the Willys-Overland Co. The club house is pleasantly located at Bay View park. It was formally opened Saturday evening and about seventy foremen of the company were present. The club house was beautifully decorated for the occasion and an elaborate banquet was served.

Unusual Invitation—Chicago motorists were somewhat surprised this week to receive a letter from Mayor W. H. Stolte, of Chicago Heights, Ill., calling attention to the fact that the Chicago road running into his town, which heretofore has been in horrible shape, has been greatly improved and that he would be pleased to have motorists make use of the fine highway which has been provided.

Davenport Events—As a result of the hill-climb and races held in Davenport, Ia., on the Fourth, under the auspices of the Tri-City Speedway Association, the best time in the former event was made in a Pope-Hartford by Pete Petersen, a local driver, with a mark of :17½ for climbing four blocks of one of the steepest hills in the city. A Buick finished second in :19, and a Colby third in :21½. In the races at the mile track in the afternoon the big event, 10 miles for a \$300 prize and the Petersen cup, was won by a Midland six, driven by Duby. Duby's time was 10:48½.

Wants Pittsburg Streets Repaired—The Automobile Club of Pittsburg is preparing to wage a hard warfare in the interest of getting the city streets repaired. Pittsburg streets never were in such poor condition for motoring as at present. A committee from the club appeared before the old city council a few weeks ago and presented its claims in an emphatic manner.

Since then the Pittsburg Railways Co. has been doing more work on certain well known thoroughfares, so that the club is encouraged to continue the warfare. In a few days its street committee, whose chairman is W. H. Seif, will appear before the new council of Pittsburg and continue its demand for better streets, basing its claims largely on the fearful condition of the best motoring thoroughfares in the city and calling attention to the large number of accidents which are caused by defective paving, etc.



TROPHY GIVEN BY MINNEAPOLIS JOURNAL FOR THE
TWIN CITY-HELENA TOUR

WASHINGTON, D. C., July 8—Interesting reports concerning the motor industry as compiled by the American representatives abroad are found in current issues of the Daily Consular and Trade Reports. One of them is from Consul-General Frank H. Mason, of Paris, who says:

"There were 98,000 horses in service within the walls of Paris at the close of 1900. In 1909, notwithstanding the increased population and traffic of the city, they had diminished in number to 78,000, and are still decreasing at the rate of about 2,000 per year. Even the great laundry companies now collect and distribute their linen by means of motor vans, and the leading grocers and department stores deliver goods, not only in the city and suburbs, but to distances of 40 or 50 miles in the surrounding country.

Paris' Omnibus System

"The omnibus and tramway service of Paris is in the hands of a corporation, La Compagnie Générale des Omnibus, organized in 1854 as an omnibus company exclusively, but which has since absorbed horse, steam, compressed-air and electric tramway lines until it controls substantially all the machinery of public passenger traffic within the city except the metropolitan subway, which was built by the municipality. The company obtains periodically from the city a concession, or monopoly, for a stated period of years. Its last preceding concession expired on May 31, 1910, at which time it had in service six lines of motor buses, thirty-eight lines of two and three-horse omnibuses, and thirty-one lines of tramways operated by steam, compressed air and electricity. The omnibus lines have an aggregate length of 156 miles and carried in 1909 115,061,498 passengers.

"As the time approached for a renewal of the concession last year, the company found the municipality less indulgent in respect to improvements. The horse-drawn omnibuses and compressed-air and steam tramways were pronounced obsolete. The motor bus had been on trial since 1906 and had proved fairly satisfactory, but the earlier type had shown serious defects. It was of two stories or decks, the upper one, or imperial, being approached from the rear platform by a narrow winding stairway, inconvenient and often unsafe for women and children. The height of the body required it to be hung on stiff, rigid springs in order to give the vehicle sufficient stability when loaded. This caused an undue vibration, and, with various defects in the motor and gearing, rendered the motor bus noisy and disagreeable. It had the merits of speed, cleanliness and manageability, it traversed mainly streets which are not served directly by tramways or the subway, and it pointed the way to the new era of public omnibus service in Paris.

"During the salon of December, 1906, there was opened a competitive and prac-

Our Foreign

Reports Filed With United States Government Tel
of European Conditions and Offer Valuable Sugges-
tions to the American Motor Car Manufacturers

tical test of motor buses. Nine competitors entered the contest, which continued 15 days and gave the Parisian public its first taste of the possibilities of the motor bus. The speed attained ranged from 8.7 miles per hour, during the forenoon, to 5.6 miles, during the afternoon, when the streets are thronged and often blocked by traffic.

"The result of the competition was in favor of two models, the Brillé and the de Dion-Bouton, which became the basis of the two types of motor bus which have been finally adopted and are being put into service as rapidly as they can be delivered. It was decided, in the first place, to suppress the imperial, or upper story of the motor bus, lengthen the body and add a spacious rear platform, so as to give places for thirty-two to thirty-five passengers—the same number that is carried by the double-decked vehicles of the original type.

"The Brillé-Schneider bus, one of the types adopted, has a four-cylinder gasoline motor of 40 horsepower, cardan drive, with three speeds, which at 900 revolutions per minute give a pace of about 17.5, 12, and 4 miles per hour, respectively. The vehicle weighs empty 11,400 pounds, and with thirty-five passengers on board about 15,400 pounds. The weight of the body rests mainly upon the hind wheels, which are set in under the body so that the hubs do not project beyond the outer line of the vehicle. The rear wheels have solid tires, in three sections, sufficiently broad to minimize the wear and tear upon pavements. Four hundred motor omnibuses of this type have been ordered by the Compagnie Générale, of which sixty were finished and in service on April 1, 1911.

New deDion Bus

"The new bus of the de Dion-Bouton model is similar in size and general appearance to the Brillé-Schneider vehicle, except that the tires are all of rubber and the rear platform is hung slightly below the level of the chassis. The motor has four cylinders and develops, at 1,000 revolutions per minute, 40 horsepower. It is likewise cardan driven. Three hundred of these vehicles have been ordered, a portion of which are already delivered and in service.

"The concession or contract of the General Omnibus Co. with the municipality was renewed on June 1, 1910, for a period of 40 years, and stipulates that on June 1, 1913, the last horse-drawn omnibus and

the last steam or compressed-air tramcar shall have been withdrawn from service on the streets of Paris, leaving but three systems of public passenger traffic, the motor bus, electric tramways and the metropolitan subway.

Three-Wheeled Electric

"Another recent novelty is the three-wheeled electric delivery voiturette, which has been adopted by large retail establishments that have many deliveries of small packages to be made daily in the city and suburbs. The special type most in use is known as the Beff model and is a Swedish invention. The battery is carried under the seat of the driver and consists of twenty elements of 2.2 volts, with a capacity of 150 to 160 amperes. A charge of the battery costs, when the current is taken from the public supply, about 60 cents, or half that amount when the consumer has his own generating plant. A charge gives a run of from 36 to 45 miles, at a speed of 12 miles an hour. The motor is placed over the front or steering wheel and the covered van to contain the merchandise is hung upon springs between the hind wheels. The entire vehicle weighs 1,100 pounds, costs \$870, turns at any angle up to 90 degrees, and is considered a triumph of practical economy and efficiency.

"Among the other kinds of vehicles that are turned out in constantly increasing numbers are military ambulances, ammunition and supply wagons, motor tank wagons for oils, acids and other liquids; camions, or drays; freight wagons of all kinds up to 12 and 15 tons capacity; a combined street-cleaner and sprinkling car, which is now on trial, and an armored motor car equipped with quick-firing guns, which has been made by a Paris manufacturer for the Spanish government.

"As a result of high quality, moderate prices and an intelligent organized effort on the part of the associated manufacturers of France, the export of motor vehicles, especially to South America, Scandinavia and Russia, is rapidly increasing. Such exports amounted to \$9,340,000 for the first three months of 1911, as against \$6,585,160 for the corresponding period in 1910.

"Paris is a difficult market for motor cars of foreign manufacture. Frenchmen naturally prefer a car of French manufacture, made at a factory to which it can be conveniently returned for repair in case of accident. The supply of cars from the home factories is always in excess of

Relations

English Commercial Agent Declares There Is Great Market for Yankee Cars in United Kingdom and Believes Racing Is a Good Advertising Medium

the demand, and for those who wish to economize there is a constant supply of second-hand vehicles, which have been overhauled and repaired at the parent factory and sell at merely nominal prices.

"Notwithstanding all this there has been, and is still, a certain market for low-priced cars of from 10 to 16 horsepower, which can be sold from \$1,200 to \$1,800. By means of good local connections, liberal exhibitions at the salon, and skillful management, several American-made cars, notably those of the Ford Motor Co., of Detroit, and the Mitchell company, of Racine, Wis., have been established here and are doing an apparently successful business, particularly with the country districts and smaller cities of France. To introduce any foreign-made car here involves, of course, the setting up of a repair shop fully supplied with parts and materials, and ready at all times for immediate and skillful service."

Report from England

Another report concerning the industry in the United Kingdom comes from J. D. Whelpley, commercial agent, who says:

"The man whose views are quoted in the following report has been engaged in the selling of American-made motor cars in England for the past 8 years—originally under a concession granted by one of the largest manufacturing companies in the United States and recently as one of the principal officials of the London establishment of the same company. His experience has been more extended and more complete than that of any other man in the trade. He said recently, in speaking of the situation in England as it applied to American cars:

"There is undoubtedly a great market in the United Kingdom for not only the cheaper grades of American cars, but for the more expensive ones, as well. Manufacturers entering the English market now will have a big advantage over the pioneers who blazed the trail during the past 7 or 8 years. We who have been working in England all these years are now beginning to reap the benefit of our hard fight, and the American manufacturer coming into the English field will find it easier, because he will obtain the benefit of the hard work of the nine American companies whose cars are now on the market here.

"But I do not wish to convey the impression that a firm entering the market will find the selling of cars easy. It will be about the hardest work imaginable.

For months and months it will be uphill work, apparently against hopeless odds. It will mean large sums spent in advertising, and, above all, it will mean that the car itself will have to make good in actual experience. One of the greatest obstacles I ran up against was the quite natural preference for English-made cars. Then I had to combat the unwillingness to buy a car that looked strange to the English purchasers. My car was too light, they said; it was too wide, the mud guards were shaped wrong, and there were a dozen other peculiarities that combined to make sales almost impossible.

"Today it is much the same story, except that we are able to interest hundreds of possible buyers now where we were able to interest only one some years ago. But the majority of the people who buy American cars now do so only after they have been followed up for months and months. In other words, they want a great deal of convincing. Fourteen or fifteen months of constant pegging at one customer is quite an ordinary experience. The American manufacturer who enters the English market now must make up his mind to a big advertising campaign. He will find that he can teach the English manufacturer very little in the publicity line.

Ireland Likes American Cars

"Curiously enough, I have found it easier to sell American cars in the wildest parts of Ireland than in any part of England or Scotland. Undoubtedly sentimental reasons had a great deal to do with that. There was no prejudice against American-made cars, and many of the Irishmen I approached were in constant receipt of newspapers from friends or relatives in the United States and were readers of the advertising and news matter. Many of them knew almost as much about my car as I could tell them. That was true of the south of Ireland, but it did not hold good of the north, where the sentimental bond with the United States is not so strong. I have been selling cars for many months in Dublin, but despite the fact that I have been trying my best for a long time past I sold my first motor car in Belfast only last month.

"The American manufacturer with a cheap car will not find the English competition as determined as one with a medium-priced car. Some years ago there were quite a number of companies turning out comparatively cheap cars in England, but they have in most cases gone out

of business. The American manufacturer has a big advantage over his English competitor. The former has his home market, which is closed by the high tariff wall to the English car, and he can sell his cars in the English market at American prices, plus expenses—a comparatively small item more than equalized by incidents of manufacture—and in every other market of the world he trades with his English rival on level terms. Of course, the sale of cheap cars can never be as large in England as it is in the United States. The same class of people that find it easy to pay \$650 for a car in the United States find it difficult to lay aside half that sum here. When it comes to the medium-priced cars, the American manufacturer will find very strong competition here. I could name a dozen English cars that are dangerous competitors, and so even are they in merit that it is almost impossible to make a choice unless a purchaser has some fad to be found in one or other of the dozen.

The Cheap-Car Market

"My experience has been that the cheaper cars sold in the English market do not supply a trade that can not afford a more expensive car. They are sold at the expense of the higher-priced motor cars to purchasers who have had experience with the latter. These purchasers, who can well afford to pay the extra money, feel that a cheap car will do them just as well. In other words, the manufacturers of low-priced cars are not creating a new buying public, but are doing the major part of their business with people who have already owned cars.

"There is a section of the trade here, as in the United States, that believes the day of racing as a means of advertising is past. But I am not of that opinion. One has but to look at the record of two of the most successful cars now on the English market to realize that racing is still one of the best means of advertising a car. The companies manufacturing the two cars I have in mind were on the verge of bankruptcy a few years ago. Their accounts showed a steadily growing deficit every year and it was thought that they would have to go out of business. Finally they decided to go in for racing at Brooklands. They have been successful, and today are in a flourishing condition. Racing was their salvation.

"American cars have taken a very small part in the racing at Brooklands. It has been almost impossible to get the American manufacturer interested in it. I suppose it is too many miles away from home. Some of the larger companies have been promising to come over and challenge the English manufacturers in a determined manner, but nothing has come of it. Perhaps they were too busy with racing in the United States, but now that there seems to be an inclination to abandon that form of advertisement at home possibly more attention will be paid to the English field."

DIGEST

Cylinders in motor car engines wear. Some wear due to lack of lubrication, others to age, and some are scored because of grit or other particles getting between the pistons and the cylinders.

When cylinders wear or get scored, the compression is lost and so the power is reduced. The only remedy is to bore out the cylinder, that is, make it larger in diameter. If it were 4 inches in diameter it could be made .005 inch larger. Then larger pistons and new rings are needed.

This paper suggests as follows how to handle the problem:

The adoption and furnishing of certain oversizes of pistons and rings would be an extremely advisable thing for the manufacturers of motor car engines to arrange.

The manufacturers have correct patterns and jigs and equipment to manufacture them correctly and economically and of the proper weight, size, so that they can be made interchangeable.

The agents in the different towns and cities could at a very slight expense carry a small stock of these oversize pistons and rings, the oversize being .010, .020, or .050-inch larger than standard. It would be a simple matter in cases of scored cylinder to have it refinished to .010, .020 or .050-inch over standard size.

The oversize pistons should be made by the manufacturer to weigh exactly the same as the standard pistons, so that a new oversize motor would run as smoothly, so far as the weight of the reciprocating parts are concerned, as when it used the original pistons.

Certain manufacturers are furnishing oversize pistons and rings at the present time, there being three dimensions of oversize, namely, .010, .020 and .030-inch. A piston, a set of rings with pin and screws complete for one cylinder costs \$5.70 for a four-cylinder model, and \$6 for a six-cylinder model. Were these oversize pistons and rings made by the repairman the cost would be \$20 or more for each, owing to the lack of facilities that the repairman and garageman have for handling the different parts.

This is one great reason why the manufacturer should produce the oversize pistons standards and not leave it to the repairman or the garageman.

It is a big problem to settle on what oversize standards should be used. Very few cylinders will clean out with less than .010 or .020 inch of stock removed.

When the scoring is deep and the cylinders show much wear .025 or .030 or even .040 inch has to be removed in grinding for a satisfactory surface and accurately round cylinder can be had.

Two oversize pistons will suffice for all general uses, the first being .015-inch large and the second .035 or .040-inch large.

The .015-inch oversize would be practically 1/64-inch larger, and the .040-inch would be 1/25-inch oversize.

Any cylinders in which the walls are of reasonable thickness will stand this amount of increase, as it means but 1/50-inch on each side.

Helping the Car Owner

Suggestions That Manufacturers Make Oversize Pistons and Rings To Be Used by Those Who Are Crippled By Cylinders Being Scored

Ideas Advanced to Engineers by J. M. Heald

FOR several years the motor car and gas engine manufacturer has been so busily engaged in the development and perfecting of his machines and meeting the demand upon him for his product that he has, up to the present time, apparently given very little thought to the ways and means for reducing the cost of maintenance among his customers, as well as for preventing the delays so frequently met with in repairs that are required from time to time.

Thousands and thousands of people have taken up the car very enthusiastically, but there are many users of cars today who can ill afford them, due principally to the cost of up-keep; and after a time they cease to be purchasers of cars and equipment.

Discourages the Owner

When the owner of a car finds that he has a scored cylinder or that the cylinders are badly worn he is face to face with a difficult problem to solve to his satisfaction. He can send to the manufacturer for a new cylinder, or he can have his old cylinder refinished and have new pistons and rings made up in some local machine shop; but either method has great disadvantages, both in regard to the time that his car is out of service and also with regard to the expense of the repairs to be made.

The purchaser of a car is held up in so many ways that it is discouraging to one who thinks seriously of buying a car; he may decide that he can afford to spend a certain sum, but when he comes to look into the question carefully, if he pays about that sum for the car, he often finds he has still a top to buy, a windshield, a gas tank and other items of equipment, to say nothing of the things it is convenient to have in the garage in the way of gasoline tank, oil cans and accessories. Then if any repairs are needed the cost is seemingly out of proportion to what it should be.

The point of interest in this is that there are so many expenses connected with the running of a car that it would seem a desirable thing for the manufacturer and the repair man to adopt any plan by which the time and expenses of making repairs

to an engine are reduced to the lowest point.

If the owner of a car, who finds a cylinder badly scored, concludes to send to the factory for a new cylinder he is usually called upon to wait a considerable length of time, first, because such orders usually take their turn in being filled, which requires a certain amount of routine work in the factory in the way of entering orders and boxing and shipping out the same; and, secondly, the time required for the order to go to the factory and the goods to come to the purchaser seems considerable if the manufacturer is 500 or 1,000 miles away, especially if one is in a hurry to get his car in commission.

Furthermore, as many of the engines are now made with cylinders cast in pairs, or en bloc, an imperfection in one cylinder bore makes it necessary to throw away cylinders in which the other bores are in perfect condition, in fact, in better shape than any new cylinder which will come from the factory can be, because the old rings and pistons will not usually fit the new cylinder as well, and in any event the new cylinder is comparatively rough, and does not have the excellent bearing and contact with the rings which was the case with the holes in the cylinder discarded.

For that reason the ability to refinish a cylinder by the repair man is most desirable and means a considerable saving in time and money to the owner of a car.

The advantages of being able to refinish cylinders are not confined to those which have become scored up in running, but apply equally in the case of ordinary wear, which is found in all engines after running 10,000, 20,000 or 30,000 miles.

In this case the refinishing of the cylinders and the substitution of new pistons and rings also means the putting of the engine in first-class condition at a minimum cost.

Refinishing a Cylinder Bore

The refinishing of a cylinder bore can be most easily accomplished by the use of a cylinder grinder, such as have been used for a good many years by almost all the leading concerns in the manufacture of motor cars and gas engines.

The process of grinding a cylinder to refinish it is extremely simple and much easier to handle than the reboring of cylinders in a boring mill or by any other method. It is a very easy matter to mount a cylinder on one of these grinding machines, as all that is necessary is to clamp it against an angle plate by the

EDITOR'S NOTE—The paper read by James M. Heald, member Society Automobile Engineers, at the summer meeting of the society held at Dayton, O., June 15, 16 and 17, 1911. The brief discussion after the reading of the paper is also given.

crank end of the cylinder, and any amount of stock can be removed that is necessary to produce a perfect hole and remove the scoring or other imperfections that may exist.

The use of the grinding machine makes it possible to enlarge the hole any desired amount, whether it be .010 inch or .020 or .030, and the grinding wheel finds no difficulty in removing the smooth and polished surface found in a cylinder after it has been run for a time, whereas on a boring mill a heavy cut must usually be taken in order that the tool can get underneath this polished surface, which means, of course, that the bore is then unduly enlarged, and, moreover, a comparatively rough surface is left by the boring tool, which is not the case with refinishing on a grinding machine.

Autogenous Welding Utilized

Oftentimes cylinders are injured by having a corner of the cylinder and flange broken off, and very frequently cylinders are brought to us to be refinished in which these broken pieces have been brazed on again or joined by autogenous welding—in fact, there are now many plants about the country advertising and offering to do this work promptly and cheaply.

In this case the usual condition is that the bore of the cylinder, except at the very end near the crankcase, is in firstclass condition, and no new pistons or rings are needed, but it is important to refinish the lower end of the hole where the brazing has been done, because this usually leaves a very rough and uneven surface, and oftentimes as much as $\frac{1}{8}$ inch in spots must be removed to get down to the tube surface, so that the piston and rings can again enter the bore.

In such cases the grinding machine is of the greatest possible advantage, because the cylinder can be located in the machine and adjusted to such a position that the grinding wheel will remove only the surplus stock which the welding process has put on, and this can be made absolutely concentric with the balance of the hole, and the cylinder made as perfect and as satisfactory as though no accident had ever occurred.

This can be done at a fraction of the cost of a new cylinder; in fact, in general terms the cost to the customer does not exceed \$2 to \$3 per hole, even where the entire cylinder is refinished to .010 or .015 inch over the original size.

Occasionally in refinishing a cylinder the scoring is so slight that an increase in diameter of perhaps .005 or .006 inch only is necessary to produce a perfect hole. In such cases it is often considered a question whether a new piston is necessary, and frequently customers will decide to use the old pistons, together with a set of rings which are made enough larger to make up for the increased diameter of the bore. Just how much larger the bore can be made than the standard size and have the old piston prove satisfactory to the

average user is a very debatable question.

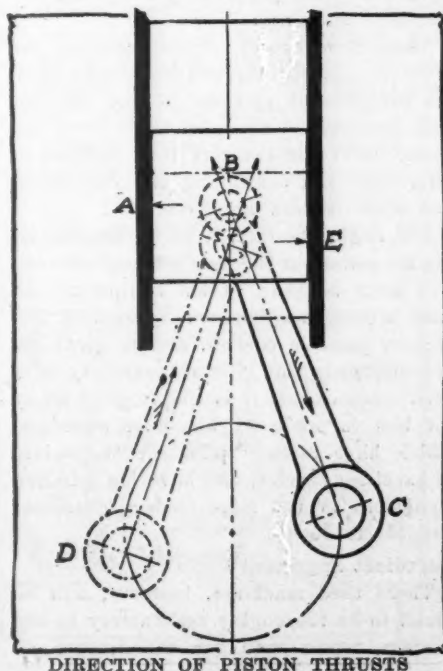
An examination of some of the forces acting in the cylinder may throw some light on this problem; in the accompanying illustration it will be noticed that when the piston is descending due to the force of the explosion it is pressed against the side of the cylinder A, owing to the angularity of the connecting rod B-C in its downward travel, but when the crank has made a half revolution and the crankpin is at the position D the resistance above the piston to its upward movement produces a pressure of the piston against the wall on the opposite side, as at E, and for that reason it is generally considered, as we understand it, that when there is too much clearance between the size of the piston and the cylinder bore the engine will become noisy on account of the alternate crowding of the piston against one side and then against the other side of the cylinder at every half revolution.

When there is much difference in size between piston and cylinder, of course the opportunity for leakage of gas through the cut in the ring is increased, and it becomes more difficult to maintain compression, especially when the rings are worn a little and the cylinder walls have worn a little, and the opening where the ring is split has become of some little width.

Making New Pistons and Rings

It therefore seems desirable to make new pistons and rings to secure a quiet running engine when any considerable amount of stock is removed in the refinishing of the cylinder bores. From our experience we would set the limit of increase in size to .005 or .006 inch if the old pistons are to be used.

Now new pistons being decided upon, the question comes as to securing these. As we understand it, very few of the manufacturers of engines are prepared to furnish anything but the standard size pistons.



They are also not particularly anxious to furnish rough castings to the repair man to be used in making pistons of oversize dimensions, and even if they were, too much time is required to send to the factory to secure these.

For that reason the job shop is called upon to make a pattern for a piston and to fit up the castings. The cost of the pattern is a variable quantity; if a good many castings were wanted, of course, it would pay to make a reasonably good pattern, but if there are only one or two pistons wanted, as is usually the case, one feels like making a pattern as cheaply as possible.

Oftentimes a shop which has had considerable of this work will look over its patterns and find a pattern which comes somewhere near in dimensions to that which is wanted at the time, and with a little patching or fixing that pattern is made to serve. But the casting which is secured from this pattern may vary largely from the correct dimensions and weigh half a pound or a pound more than the other pistons in the engine, which cannot be conducive to smooth running when the engine is assembled with this odd-sized piston in the outfit.

After this casting is secured the question of machining the piston comes up, and while this is an easy thing to turn up to approximately the right size, the putting of the hole through for the piston pin at exactly right angles to the center line of the piston is a problem which has too little consideration usually; and unless this is correctly done by the piston being mounted properly on the face plate of a lathe and with suitable jigs and tools the chances are ten to one, or perhaps more nearly one hundred to one, that the piston pin will not be at right angle, and the connecting-rod will not stand in proper relation to the crankpin when an effort is made to assemble the engine.

This means a noisy engine, one that quickly starts to pound and is hard to keep in smooth running adjustment. Therefore it seems that the adoption and furnishing of certain oversize standards of pistons and rings would be an extremely desirable thing for the manufacturer of engines to arrange.

Makers Are Equipped

In the first place, the manufacturers have the correct patterns; they have the jigs and equipment to make these pistons and rings correctly and commercially and to the proper weight and size, so that the piston pins, bushings, connectingrods, etc., are all interchangeable.

The manufacturer's agent in any town or city could at very slight expense carry a small stock of these pistons and rings of .010, .020 or .050 inch over size, according to what standards and how many were adopted. Then it would be the simplest possible matter, in the case of a scored cylinder, for the repair man to simply have the one cylinder bore refin-

ished to .010, .020 or .050 inch over standard size, and the engine could at once be reassembled with the new piston and rings with the least possible delay and expense for this work.

The pistons could be made by the manufacturer to weigh exactly the same as the standard piston, and therefore a new piston assembled in an engine would run as smoothly with regard to weight of reciprocating parts as was the case when the engine was first assembled.

The item of expense is an important one, and the contrast between these two methods is notable; the job shop man figures that the pattern for the piston will cost him \$2.50 to \$4, according to the amount of care taken in making it; the cost of turning up piston and making a set of rings will amount to from \$10 to \$20, or even more, according to the shop doing the work, per piston and set of rings, and this covers work of really the roughest character only, as compared with what is produced by first-class manufacturing methods in a well-ordered manufacturing plant; on the other hand, the regrinding of a cylinder will cost on an average from \$2 to \$3, and a new piston and rings, if made up according to manufacturing methods, certainly could be sold for only a fraction of the cost necessary where a single piston and set of rings are made up in a job shop without proper facilities and to special order.

Furnishing Oversizes

We understand that at the present time the Pierce-Arrow Motor Car Co., and possibly others of whom we have not learned, are furnishing these oversize standards in .010, .020 and .030 inch oversize.

Also that the cost to the consumer for a piston and set of rings with pin and screws complete for one cylinder is \$5.70 for the four-cylinder and \$6 for the six-cylinder style.

This indicates in the most plain and convincing manner the saving in cost that can be made by this method of handling such repairs; and the gain in time is equally as great and acceptable to the car owner.

Another advantage that would accrue to the manufacturers of cars would be in being able to advertise the fact that they were in position to furnish repairs at a moderate cost, and their agents could make repairs if needed at the lowest possible cost.

This is an item that must be reckoned with in the future selling of cars by the commercial department of car manufacturers, as it is certainly one that is being given more and more consideration by the intelligent buyer, and it would seem that it would have much influence in determining which car he would purchase.

The question of how many and just what the oversize standards should be is a matter that is open to discussion; it is our experience, however, in regrinding hundreds and hundreds of cylinders here in our

works, that very few cylinders will clean out with less than .010 or .012 inch of stock removed.

When, however, the scoring is deep and the cylinder shows a great deal of wear .025 or .030 or even .040 inch have sometimes been removed in grinding before a satisfactory surface and hole accurately round and straight can be produced.

It is the writer's impression, therefore, that two oversize standards would probably be sufficient in order to reduce to the lowest terms the stock that any agent would be obliged to carry, and his idea is that .015 inch larger for the first oversize and .035 or .040 inch for the second would really be found ample for all cases and a most satisfactory combination.

The .015 inch increase would practically be $\frac{1}{64}$ inch larger than standard, and the .040 increase is only $\frac{1}{25}$ inch. There is no question but what any cylinder in which the walls are of reasonable thickness will stand this amount of increase; in fact, a great deal more, as this amounts to but $\frac{1}{50}$ inch on each side.

The first argument against this scheme will probably be the difficulty of getting the cylinders refinished or reground by the ordinary repair man.

With regard to this point, I would say that this is a simpler matter than at first appears, because a number of repair men in different cities have already equipped their shops with cylinder grinding machines, so that they are prepared to regrind a cylinder at almost a moment's notice, and only lack the adoption of these oversize standards by the manufacturer to be in position to make the most rapid and economical repairs possible.

While some of the repair shops have installed new cylinder grinding machines purchased directly of the machine tool manufacturer, many of the repair shops have felt that the cost of a new machine was higher than they could afford, and have solved the problem by installing second-hand machines.

These second-hand cylinder grinders can often be secured through machinery dealers in different sections of the country, who have taken them in trade from the motor car manufacturers for machines of later type and containing the very latest and most modern improvement.

The engine builder, if he is manufacturing his motors in the most efficient manner, will wish to have in his equipment the most modern and improved grinding machinery possible to find, and as great improvements in this type of machinery have been made of late it is simply good policy for him to trade off his older machines, which have already paid for themselves in excellent service, and have his grinding equipment of the most modern character possible to secure.

Expedient Suggested

These used machines, however, will be found to be thoroughly satisfactory to the average repair man for the amount of

grinding he will have occasion to do, and they can usually be secured for a small portion of the original cost, say from one-third to one-half of the price of a new machine.

This enables the repair man who appreciates the value of one of these machines to secure it with a moderate investment, and the returns on this investment will be found to be satisfactory.

It is not necessary, however, for every repair man to invest in a cylinder grinder to make this plan a success, as a single machine, even in a city of moderate size, would probably be sufficient to take care of all the work of this kind needed in that vicinity, and enable all those who were making repairs to profit by this improved method of handling the work.

This changing off of machines is also an excellent thing for the manufacturer, as it enables him to keep his equipment in the best possible condition for manufacturing at the lowest cost consistent with high-grade work.

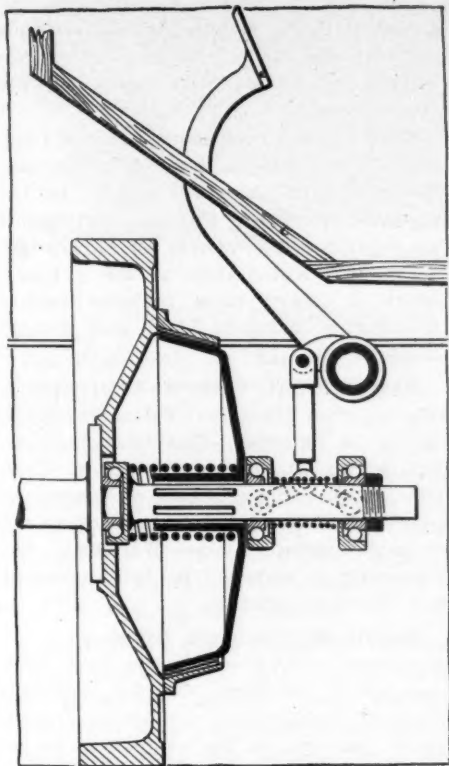
It therefore seems to the writer that these two factors, the manufacturer and the repair-man, can work together along these lines to the greatest possible good.

Now this whole proposition to be most satisfactory must be mutual; it is of no great advantage for the repairman to install a cylinder grinder for the refinishing of holes and still be obliged to go to the job shop for his pistons and rings; neither are the full advantages secured for the manufacturer to adopt and furnish the oversize pistons and rings unless the cylinders can be readily refinished to oversize dimensions to accommodate these. But the advantages are so obvious and the means of accomplishing them are so easy that it is the writer's most earnest hope that this will be appreciated by these concerned, and this most desirable arrangement be worked out to the mutual advantage of all parties, both financially and in the matter of time, in making engine involving cylinders, pistons and rings.

Coffin Discusses Subject

"Throughout the manufacturing season there is always a certain percentage of faulty cylinders through oversize. A cylinder is a pretty expensive portion of the car construction and naturally there is considerable regret in the manufacturing department about having a scrap pile of cylinders charged to the department. Our own practice is to save up cylinders which are oversize and at the end of the season bring through a series of motors using these cylinders, properly numbered so that the service department can keep track of them, and regrind them to a certain definite oversize. This saves a great deal of money. It would seem very simple for the society to adopt certain dimensions for oversize and for reboring of such cylinders to which it might be necessary to fit larger pistons. We might go up by steps of .05-inch or 100th of an inch or something of that sort."

Current Motor Car Patents



DAIMLER CLUTCH CONSTRUCTION

DAIMLER Clutch Design—No. 996,319, dated June 27; to Paul Daimler, Unterturkheim-Stuttgart, Germany—The feature of the clutch to which this patent relates is the simple and effective means employed to operate it. The patent covers a friction cone clutch comprising, in combination a shaft, a friction element fixed on the shaft and having a conical friction surface, a second shaft axially aligned with the first shaft, anti-friction devices intermediate the shafts a second friction element splined on the second shaft and having a conical friction surface, means axially arranged intermediate the friction elements for normally holding them in engagement, a fixed part on the second shaft and toggle lever mechanism operatively connected between the fixed part and the second friction element and oper-

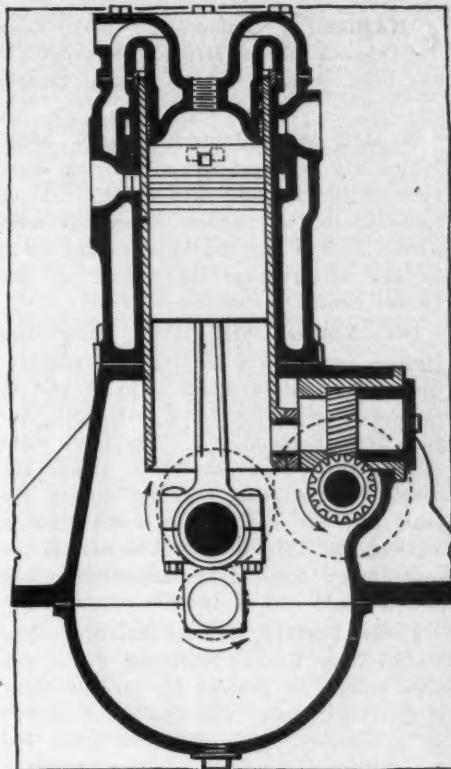
ating to disengage the friction surfaces.

New Spicer Universal Joint—No. 996,156, dated June 27; to Clarence W. Spicer, Plainfield, N. J.—As shown herewith, this patent covers an incased universal joint for power transmission, comprising in combination two connected power transmitting universal joints provided with casing members, and a closure intermediate, the members comprising two telescopically-related members, one bearing against the one casing member and the other against the other casing member. This type of universal joint should be particularly adapted to positions such as that between the clutch and gearset of cars having the gearset located amidships.

Traffic Signalling Tail-Light—No. 996,144, dated June 27; to George A. Robinson and Frederick Grinham, St. Louis, Mo.—This patent, as illustrated, pertains to a tail-light traffic-signal for motor vehicles, comprising a brake-lever, a brake, a tail-light rotatably mounted in the rear of the vehicle, a pushing-and-pulling rod connecting the tail-light and the brake-lever by a yielding-connection, a bracket upon which the tail-light is rotatably mounted, and stop-pins projecting downwardly from the lamp to contact with the bracket and limit the movement of the tail-light.

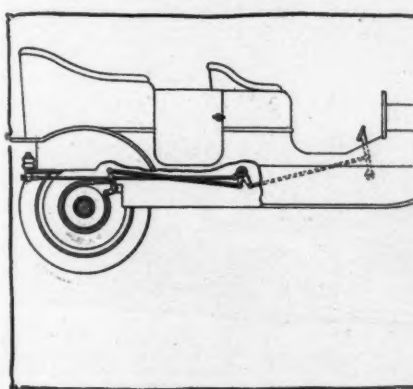
Sleeve-Valve Motor—No. 996,339, dated June 27; to Edward Hoiland, Auckland, New Zealand—As shown in an accompanying illustration this patent relates to a motor of the four-cycle type in which the inlet and exhaust gases are controlled by means of a sliding and rotating sleeve arranged between the cylinder wall and the piston. It comprises a cylinder, a sleeve slidable and rotatable in the cylinder, a socket upon the lower side of the sleeve, a ball fitting the socket, a shaft having a crank pin whereon the ball is slidable and rotatable, and helical gearing for rotating the shaft.

Green Pivot-Light—No. 996,405, dated June 27; to William F. Green, Modesto, and Charles W. Lineker, Oakland, Cal.—This patent applies to a means for con-

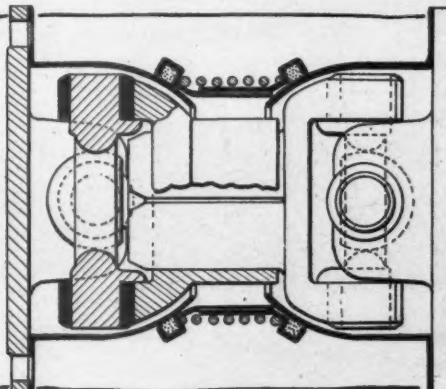


HAILAND SLEEVE-VALVE MOTOR

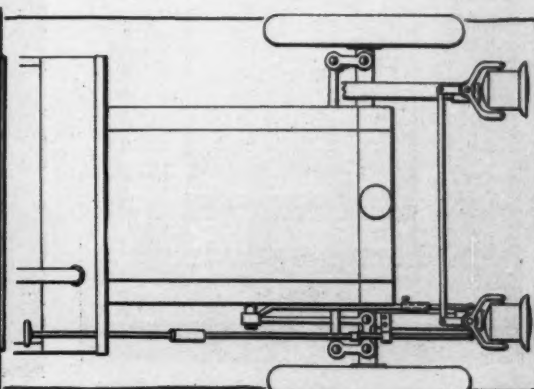
trolling the direction of the head-lamps either automatically or manually from the driver's seat. The arrangement comprises a pair of lamps, rotary pedestals on which the lamps are mounted, each of which pedestals have an arm, a connecting rod pivotally connected to the arms of the pedestals, a second arm on one of the pedestals having a rod connecting this arm with the steering mechanism of the motor car and formed in sections, one slidable from the other, one of the pedestals being formed with two rotary members and one of the lamps being mounted on one of them, an arm projecting from this rotary member, and a rod pivotally connected to the arm and extending to a point adjacent to the steering wheel of the vehicle for operating the lights independent of the steering mechanism.



SIGNALING TAIL LIGHT



NEW SPICER UNIVERSAL JOINT



GREEN PIVOT-LIGHTS

Among the Makers and Dealers

CHANGE of Name—The firm name Omaska Tractor Mfg. and Foundry Co. has been changed to the Downs Tractor Co.

W. McK. White Joins Reeves—W. McK. White has resigned as advertising manager of the Premier Motor Mfg. Co., of Indianapolis, to become associated with Alfred Reeves and Montgomery Hallowell in the advertising department of the United States Motor Co.

Des Moines Will Have Show—Des Moines dealers are making big preparations for the show which is to be held in connection with the Iowa state fair, August 24 to September 1. The Iowa state fair is the one event which brings the people of the state together during the year, and the dealers are looking for a big business. The show will be held in the space below the big amphitheater at the race track.

Veeder Factory Will Be Enlarged—The Veeder Mfg. Co., at Hartford, Conn., has been forced to enlarge its present plant at Hartford, Conn. The new structure will be of concrete and structural steel, the floors being reinforced with expanded metal and the beams with steel shapes. The completed building will be three stories high and about 43 by 183 feet in size. Concrete floors are to replace the floors in the present building and

steel beams are to be encased in concrete. New Lally patent columns are to be placed under the beams to support the increased load.

Monihan Handling Premier Publicity—J. G. Monihan, now with the ocean-to-ocean tourists, has been named as advertising manager of the Premier Motor Mfg. Co., succeeding W. McK. White, who goes with United Motors.

Erecting New Brass Foundry—The Warner Instrument Co., manufacturing the Auto-meter, horographs, etc., is constructing a new brass foundry at Beloit, Wis. It will be 32 by 45 feet in size. The present foundry will be needed as an addition to the power house.

Making Motors—The Holbrook-Armstrong Iron Co., of Racine, Wis., is now manufacturing motors for cars and trucks on an extensive scale. The company's line includes large and small engines for pleasure cars and heavy-duty types for commercial cars.

Change of Control—John J. Behen and S. F. Behen sold their controlling shares in the Behen-Faught Motor Car Equipment Co., of St. Louis, on April 17 to the remaining partners. It is now announced that another deal has been made effective whereby W. M. Johnston, formerly in the car business in Denver, has secured control of the business.

Doing Motor Business Only—The Fuller & Johnson Co., of Madison, Wis., manufacturing gas and gasoline engines, implements, etc., has turned over all departments with the exception of the engine division to a new company, the Madison Plow Co., and will in the future devote its undivided attention to the motor business. It is rumored that the company will in-

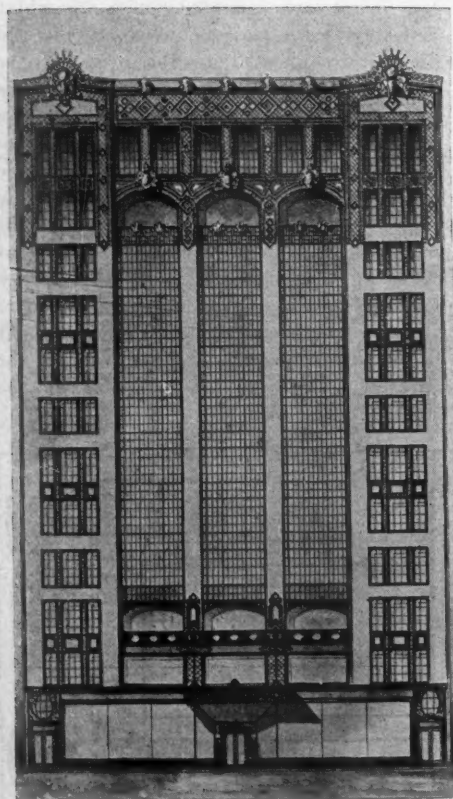
crease its line of engines to include motors for cars and trucks, its present business being mainly in the utility engine and farm tractor line.

Good Business in Spokane—The 1911 season will show an increase of 20 per cent in sales over the 1910 season in the Spokane territory. Spokane distributors are organizing their forces for inroads into every nook and cranny of the territory, which in many cases includes eastern Washington, northern Idaho and western Montana.

New Carbureter Concern—Comprising R. Crofoot, Fred Bintz, Bert Patton and M. K. Miller as members, the Charlotte Carbureter Co. has been organized at Charlotte, Mich. The members purchased the patent of a new carbureter some time ago from the inventor, James Whitecomb. The carbureter is protected by both American and Canadian patents.

Recruit for Henderson Company—R. P. Henderson, for several years past sales manager of the Parry Mfg. Co., manufacturer of horse-drawn vehicles at Indianapolis, has sent in his resignation, to become effective October 1, at which time he will join the Henderson Motor Sales Co., Indianapolis, distributor of the Cole cars, of which his brother, Charles P. Henderson, is president.

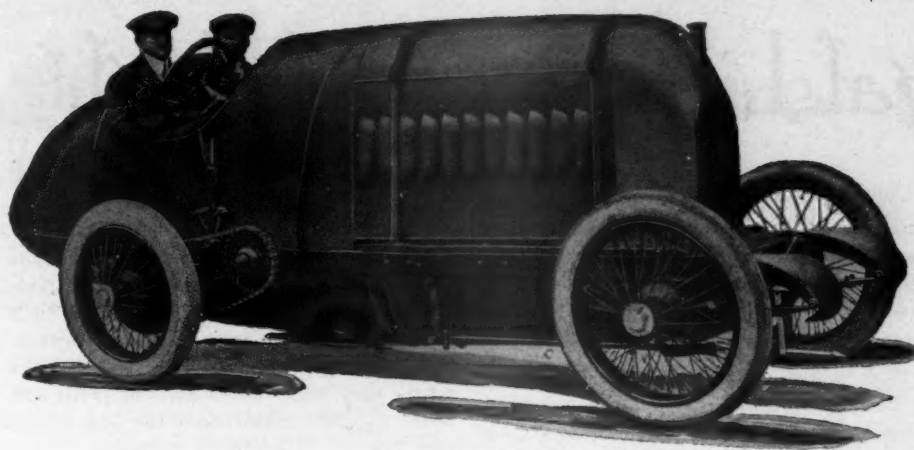
Will Make Fire Apparatus—A company has been formed at Wilmington, Del., headed by James J. English, president of the Wilmington Brass Co., for the manufacture of motor fire engines. It is proposed to establish a plant in Wilmington, an option having been obtained on a group of buildings at Eleventh and Bennett streets, which were formerly used by Smith & Painter in the manufacture of fruit juices.



ELEVATION OF LOCOMOBILE'S NEW YORK BRANCH



STORE OF THE OSEN & HUNTER AUTO CO. OF SEATTLE, WASH.



TYPES OF FOREIGN RACING CARS—NEW 300-HORSEPOWER FIAT

Associated with Mr. English is John T. Lalley, also an officer of the Wilmington Brass Co.

Stromberg Makes Changes—N. H. Miniter, formerly special representative for the Stromberg company, has now assumed the duties of sales manager. E. N. Hynes, formerly of the Stewart & Clark Mfg. Co., has taken charge of the clerical end of the business as chief auditor.

New Warner Plant Completed—The new plant of the Warner Mfg. Co., of Toledo, O., is nearing completion and that company will have occupancy about July 15. This will more than double the present capacity in manufacturing sliding gear transmissions, steering gears, differential gears and control sets.

Reo Stock May Be Listed—R. E. Olds has returned to Lansing, Mich., from a trip to New York, where he spent several days with the purpose of investigating the advisability of increasing the capital stock of the Reo Motor Car Co., and listing it on the New York stock exchange. The matter has been under advisement for some time, as a number of New York stockholders have been urging the step be taken. Public accountants have been examining the books and the proposition will be definitely decided in the near future.

New Locomobile Building—The new building in New York to be erected by the Locomobile Co. of America is to be in West Sixty-first street, 81 feet west of Broadway. The building will have a frontage of 100 feet on Sixty-first street and a depth of 100 feet and will be 150 feet high above the curb and will embrace a basement and eleven stories above the basement. In the basement will be located a large storage space, lockers and washrooms for employees and chauffeurs' room. On the first floor will be located the showroom. In addition to the showroom there will be a waiting room for customers, private office for stenographers, private offices, large storage space for demonstrating cars, locker space, etc. On the second floor will be located the financial and mechanical departments, a large stock room and a salesroom for rebuilt Locomobiles. The top floor will be 16 feet high in the clear. In addition to having light on the

four sides, it will be provided with three rows of skylights. On this floor will be done the heavy repair work. The other floors will be given up to the paint shops, carpenter shops, trimming and body shops, general repair work, etc., etc.—all departments under one roof.

Overland Taking Inventory—The Willys-Overland plant in Toledo is taking its annual inventory and the plant will be practically closed down until July 17, when work will be begun on the 20,000 new cars it is expected to put out in 1912. All of the Overland cars will in the future be turned out from the Toledo plant instead of a portion coming from Indianapolis as formerly. The Overland is now at work on the new body-die and power plants. Wood floors in the old building are being replaced with concrete and thousands of dollars' worth of new machinery is being installed.

Duryea Plant Ready—The final steps have been taken completing the organization of the Duryea Auto Co., of Saginaw, Mich., and work begins in the large shops at the corner of Rust and Jefferson within the next week or so. The first installment of machinery has already been shipped and will be followed by others as rapidly as possible. Three styles of vehicles will be made for the coming year—light delivery, light buggies, and light conventional shaped runabouts, which latter will be fitted with pneumatic tires instead of

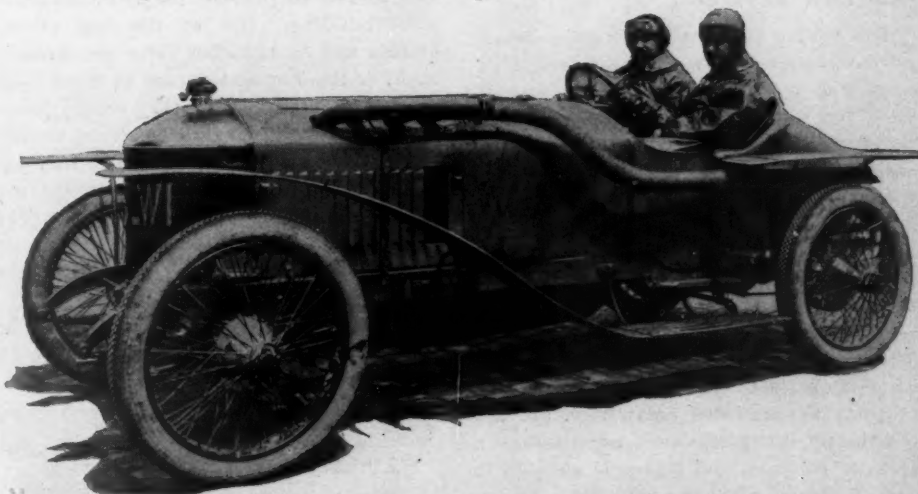
solids, as used on the buggies and deliveries. The Duryea company already has booked many orders.

Fall Show for Chicago—The Chicago Automobile Trade Association has decided to hold a show in October—not the conventional kind, but a street show with all the stores on the row decorated for the occasion. The association has opened permanent headquarters in the Lexington hotel with an assistant secretary in charge.

Motorette Spreading Out—The C. W. Kelsey Mfg. Co., of Hartford, Conn., has increased its capitalization from \$250,000 to \$1,000,000. Having secured all the available space in the old Cheney silk mill building, it has been found necessary to build a large addition, upon which work will begin at once. Besides two-passenger Motorettes, the company is now marketing two types of light delivery cars, having a capacity of 250 and 500 pounds respectively. Motorettes are now being turned out at the rate of 15 to 20 a day.

New Indianapolis Enterprise—A number of Indianapolis men have organized the Merchants' Electric Auto Co., which will sell, lease and garage electric commercial vehicles exclusively, and will be the only company of its kind in the city, although several handle gasoline commercial cars exclusively. A downtown location will be obtained and business started shortly. The company is incorporated with an authorized capitalization of \$50,000, those interested being Harvey B. Stout, Sr., Harvey B. Stout, Jr., Madaline Darrow, John E. Spiegel and Charles P. Tighe.

Will Make the Stutz—By August 1 the Ideal Motor Car Co., of Indianapolis, recently organized to manufacture the Stutz car, expects to be turning out its first machines for delivery. The company is now located in its new factory in North Capitol Avenue boulevard and is assigning agencies. Harry Stutz, of the Stutz Auto Parts Co., formerly employed by the Marion Motor Car Co., is designer and factory manager. W. D. Myers is sales manager of the company. He formerly was with the Overland, Marion and Empire.



TYPES OF FOREIGN RACING CARS—DELAGE THAT WON BOULOGNE ROAD RACE



Legal Lights and Side Lights

NEBRASKA'S NEW LAW

THE new motor law passed by the last session of the Nebraska legislature, went into effect July 7. This law provides that the registration fee for cars shall be \$2, when previously it was \$1, but the money goes into the treasury of the county in which the owner lives, to be used for good roads. This was not previously the case. The dealer only has to take out one license for each class of cars, the three classes being steam, gasoline, and electric. No one under 16 can operate a motor vehicle. A speed of 25 miles an hour is now allowed on country roads. Upon approaching any place where passengers are getting on or off street cars, the motor car must come to a full stop and shall not start until the street car has started up.

Violations of the law may be punished with a fine not to exceed \$50 for the first offense, and by a fine not less than \$50 or more than \$100 for each subsequent offense.

The city council of Omaha last week passed an ordinance similar to the provisions of the state law, in regard to cars stopping when people are getting on or off street cars.

NEW YORK LAW BEATEN

The New York state law that makes it a felony for a motorist to run away from the scene of an accident without disclosing his identity is unconstitutional in the view of the appellate division of the supreme court, as it compels a person to become a witness against himself. The court thus held in sustaining the demurrer of Edward T. Rosenheimer, a wealthy manufacturer, to an indictment found under that law. Rosenheimer killed a girl and gravely injured two other persons some time ago by running his motor car into their buggy. He was tried for manslaughter and acquitted.

OLD LAW REVIVED

The vexing problem to Virginia owners of how to deal with chauffeurs and servants who use their cars without permission, for which there was supposed to be no adequate law in Virginia, was recently satisfactorily solved in the case of William Robertson, a colored youth who partly wrecked the car of W. O. Burton in a joyride without the owner's knowledge or permission for the use of the car. The solution came about in the unearthing of an ancient statute, enacted long before motor cars came into use. The law under which Robertson was tried prescribes that property appropriated unlawfully, but not feloniously, nevertheless constitutes a form of trespass, and makes it possible to deal severely with the offender. Robertson received a fine of \$100.

Owners of cars were intensely interested in the outcome of the case, as they have heretofore found it difficult to break up the practice indulged in by young Robertson.

DISPUTED POINT SETTLED

That motor car owners have the right to keep their cars waiting at the door of their residences or their offices, and that they could not be compared with cab owners, was decided by Recorder Weir, of Montreal, in a test case, in which Joseph Versailles was the defendant. The charge against him was of having allowed his motor car to remain for hours at the door of his office on St. James street, and therefore of having caused a nuisance. The case was dismissed, with costs against the city.

NEW LAW MAKES TROUBLE

Massachusetts has a new motor law that went into effect July 1 which is rather important and will bring about changes in some of the Bay State cities. It provides that gasoline shall be classed among other inflammable fluids and not allowed to be kept in any car in a building that is used for public gatherings. In other words where there is a garage or salesroom downstairs, and any of the floors above are used for meetings, performances or dwelling purposes, no motor car may be driven into or kept in the building if there is any gasoline in the tank.

The bill was put in by Chief Whitney, of the state police, and little attention was paid to it and finally it went through. The reason for it was based on some incidents where lives were lost and others endangered, in one case in the western part of the state a young woman being trapped and burned, and in Boston because an inspector allowed a license to be given for a moving picture show over a garage. There was divided authority in the latter case and no law to prevent the two using the same building. One of the first effects of this will be to either force the Armory A. A. or the Tremont garage to move from the big circular building they occupy jointly in Boston. The club conducts weekly boxing shows in an amphitheatre and underneath is the garage where there are sometimes 200 or 300 cars housed. The club has expended \$50,000 in fitting up its quarters and it has a long lease. So have the garage proprietors.

The only compromise at present may be that when the club holds its shows each

week that all the motor cars be taken out, or that the gasoline be taken out of them. This would be a lot of bother. To take the cars out and leave them on the streets would be against the city ordinance, so it is a case of moving. There are several dealers whose premises are in buildings where they hold dances and banquets, and these will also come under the ban of the new law.

BLOW AT ST. LOUIS TREASURY

A general reduction of the price of motor car licenses is in prospect for St. Louis. A law passed by the last legislature regulating the state charge makes it incumbent on cities to charge no more than is authorized under the state law. For years the rate in St. Louis has been \$10 for each car, regardless of the size, type or horsepower. Under the new law the average charge will be about \$5.

There have been 4,632 licenses issued in St. Louis so far this year. Under the new rate, the city will lose more than \$23,000 a year in revenue. The law provides that "any city, village or town may charge an occupation tax for motor cars not to exceed the charge made by the state." The law provides the tax for cars of 12-24 horsepower shall be \$3 per year; for 24-36 horsepower the tax is fixed at \$5; for 36-48 horsepower, \$7; for 48-60 horsepower, \$8; for 60-72 horsepower, \$10; for cars with a higher rating, \$12. The new law goes into effect August 1.

ONLY ONE TAG PERMISSIBLE

The supreme court of Missouri in a recent decision holds that the St. Louis ordinance requiring license tags to be placed conspicuously on the rear of motor cars is invalid. Under the law, only the state tag can be placed on the rear of the car. This was decided in the case of the city of St. Louis against Frank E. Williams, who was arrested for failure to display his license tag on the rear of his car.

IOWA'S NEW LAW IN FORCE

The Kulp bill, the most important motor legislation passed in Iowa for several years, went into effect July 4. The bill provides for a horsepower tax on motor cars. Under the law all cars of 20 horsepower or less are assessed \$8. All cars of higher power are assessed 40 cents per horsepower. Electric cars are assessed \$5 and motor cycles \$3. This assessment is to be in lieu of all other taxes. Eighty-five per cent of the fund thus created is to be distributed equally among the counties of the state for good roads purposes. This measure means that Secretary of State Hayward will have to grant new licenses and numbers to the nearly 25,000 owners in Iowa.





Brief Business Announcements



COLUMBUS, O.—The Early Motor Car Co. has taken the central Ohio agency for the Matheson.

St. Louis, Mo.—The Mound City Sales Co., agent for Imperial tires, has removed to 2014 Locust street.

Portland, Ore.—The Elmore Automobile Agency has recently constructed a new concrete garage at Washington and Twentieth streets.

New Bethlehem, Pa.—The Anderson Hardware Co. has constructed a fireproof garage and repair shop which has been leased by Bleakney & Sons.

Buffalo, N. Y.—The new Firestone branch, 724 Main street, will be in charge of R. W. Ingersoll as manager instead of R. W. Phelps, as previously announced by the company.

Philadelphia, Pa.—The N. W. Buzby Co., 919 Diamond street, is the latest addition to Philadelphia's increasing army of dealers, having recently taken the local agency for the Dayton truck.

Elmwood Place, O.—The Elmwood Auto Top Co. has been incorporated with a capital of \$15,000 to manufacture car tops and other accessories by Frederick A. Lee and others.

Philadelphia, Pa.—A new comer to Philadelphia is the Nyberg car, the agency for which has been taken by the Manayunk Garage and Automobile Agency, 4441 Main street, Manayunk.

Philadelphia, Pa.—The Stoddard-Dayton Automobile Co., located at 253-255 North Broad street, has leased the second and third floors of the adjoining building, 257-259, in order to more adequately meet

the increasing demands of the firm's patronage. The two floors will double the former floor space of the company.

Atlanta, Ga.—The McPherson Auto Supply Co. is entering the wholesale supply business.

Seattle, Wash.—The Herreshoff, a new car in the Seattle market, has been taken on by the Olympic Motor Car Co.

Pittsburg, Pa.—The McCurdy-May Co. has let a contract for a concrete garage at Center and Negley avenues to cost \$45,000. This will give the company more than double the space heretofore occupied.

Hartford, Conn.—H. W. Bigelow, who for the past 2 years has been chief accountant for the Hartford Auto Parts Co. of Hartford, Conn., has been promoted to the position of supervisor of sales and purchases.

Columbus, O.—Herman Echardt, Jr., formerly connected with the Early Motor Co. of Columbus, in the capacity of salesman, has taken a similar position with the Robert F. Bada Automobile Co., on North Fourth street.

St. Louis, Mo.—The collapse of an adjoining building crushed in the walls of the store of the Petty Rubber Co. at Nineteenth and Locust streets, badly damaging the stock. The loss is estimated at \$75,000. No one was injured.

Spokane, Wash.—Two important changes in operating base were effected by Spokane dealers the past week, the C. H. Hornburg Co. moving from East 806 Third avenue to South Division street. The L. D. McCarthy Co. moved into the

Hornburg building at East Third avenue, establishing a garage, salesrooms and repair shop.

Columbus, O.—The Guarantee Motor Car Co. at 186 East Fourth avenue, which has been conducted by Burroughs & Wollgamott, has been purchased by G. E. Merion and C. C. Saylor, who will continue the business of a garage and repair shop at the old location.

St. Louis, Mo.—The Firestone Tire and Rubber Co. has taken a long lease on the property at the northwest corner of Compton avenue and Locust street. A fireproof steel and concrete building, two stories high, will be erected for the Firestone company on the site.

Findlay, O.—The Jackson garage in this city has been sold to F. J. Collingwood, its former manager, and E. C. Edwards, a Leipsic banker, who will operate it. The repair shop has been purchased by Herbert Summers and will be run independently of the sales room.

Pittsburg, Pa.—H. C. Frick has decided to build and equip a park garage on the rear half of the old Cathedral lot fronting on Cherry and Virgin alleys in the very center of the down town district. He will have a big basement so as to accommodate a larger number of cars than any other down town quarters.

Boston, Mass.—The White, Ware & Leatherbee Co., which has the agency for the Bergdoll, has moved into new quarters on Boylston street adjoining the Whitten Gilmore company, the Chalmers dealer. The Bailey electric that shared the old quarters with the Bergdoll agents has also moved with it to the new salesrooms.

Indianapolis, Ind.—Ideal Motor Car Co. of West Virginia; capital, \$100,000; amount represented in Indiana, \$50,000; to manufacture and sell motor cars and aeroplanes; incorporator, Henry F. Campbell, Indianapolis, Ind.

North Manchester, Ind.—North Manchester Foundry Co.; capital, \$10,000; to conduct a foundry and machine shop; incorporator, James C. F. Martin.

Wilkes-Barre, Pa.—Commercial Motor Car Co.; capital, \$25,000; to manufacture, buy and sell motor cars, appliances, etc., make repairs and maintain a garage; incorporators, Edward W. Davis, J. Wallace Davis and Thomas W. Haines.

Kittanning, Pa.—R. W. Moorhead Co.; capital, \$5,000; dealing in motor cars and accessories; incorporators, H. G. Gates, R. W. Moorhead and Elizabeth F. Moorhead.

Dayton, O.—Globe Vulcanizing and Supply Co.; capital, \$10,000; to do vulcanizing on tires and handle supplies and accessories; incorporators, W. H. Overpack, F. A. Dean, L. M. Beckett, Frank N. Frissel and E. G. Devlinger.

Akron, O.—Imperial Fluid Gauge Co.; capital, \$5,000; manufacture motor car gauges and other accessories; incorporators, J. W. McFerran, William R. Ervin, T. E. Barry, John I. A. Turnbull and F. N. Ormsby.

East Cleveland, O.—Windermere Garage Co.; capital \$10,000; operate a garage and sales agency; incorporators, W. H. Atkinson, M. J. Miller, K. F. Leet, O. F. Downes and R. A. Lang.

Cleveland, O.—Maclaren Co.; capital \$10,000; to manufacture and deal in parts and

Recent Incorporations

accessories; incorporators, Don P. Miller, Harry H. Hamilton, W. R. Godfrey, M. Marquard and R. W. Sanborn.

Columbus, O.—Radio Mfg. Co.; capital, \$50,000; to manufacture raidators; incorporators, E. W. Brinker, and others.

Wilmington, Del.—R. B. Fageol Co., capital \$25,000; to manufacture and deal in supplies; incorporators, R. B. Fageol, James F. McCloskey and William W. Armstrong, all of Philadelphia.

Chicago—Herman Motor Truck Co., capital \$50,000; to manufacture motor cars, motor trucks and accessories; incorporators, Paul W. Herman, Carmi P. Williams, Daniel G. Ramsey, C. P. Williams, Majestic building, Chicago.

Chicago—Market-Light Motor Co., capital \$150,000; to manufacture motors; incorporators, J. E. Mertz, 2127 Michigan avenue, Chicago.

Chicago—Oldsmobile Co. of Illinois, capital \$10,000; to manufacture motor vehicles, motor boats and accessories and supplies; incorporators, Emil C. Wetten, Charles H. Febler, Howard M. Harpel, 108 South LaSalle street, Chicago.

New York—Auto Trucking Co., capital \$10,000; to deal in and rent motor cars, delivery cars, etc.; incorporators, Samuel

Simons, 331 Broome street; Henry Frohwitter, 150 Nassau street; Samuel Steiner, 1796 Anthony avenue, all of New York city.

New York—Sphinx Motor Co., capital \$600,000; incorporators, Harry W. Davis, Wilmington, Del.; Graham Easter, New York city; William H. Turner, New York city.

New York—Ashton, Laird & Co., capital \$25,000; to manufacture welding apparatus, vehicles, motors, engines, etc.; incorporators, Walter E. McDonnell, E. Raven Rosen-Baum, A. Bell Malcomson, all of 132 Nassau street, New York city.

New York—Gardner-Matthews Automobile Mfg. Co., capital \$100,000; to manufacture motors, motor vehicles, etc.; incorporators, R. E. Matthews, M. D. Schmeer, New York city; J. W. Pascom, Brooklyn.

Atlantic City, N. J.—Pullman Taxicab Co., capital \$125,000; to operate motor cars, taxicabs, etc.; incorporators, I. M. Carfinkel, S. Schlein, Philadelphia, Pa.; I. S. Cohen, J. H. Kenney, Atlantic City.

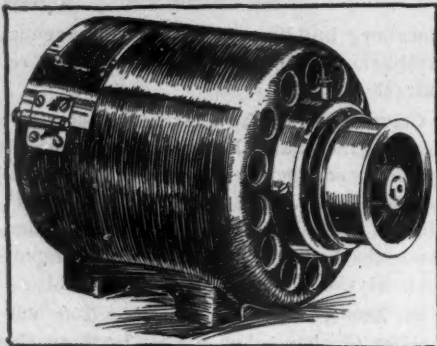
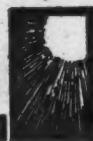
New York—American-Marion Sales Co., capital \$100,000; to handle the American and Marion cars in the metropolitan district; incorporators, James J. Handley, Charles E. Riess, George R. Morris.

New York—Manhattan Motor Wagon Co., capital \$30,000; to deal in and lease motor vehicles, livery service, etc.; incorporators, Fred J. Galvin, 27 West Forty-fourth street, New York city; J. Egbert Heiderich, Maywood, N. J.

Vernon, N. J.—Mountainside garage, Vernon, N. J., capital \$50,000; to operate garages; incorporators, Chas. J. Manning, John F. Mullins, William W. Crane, all of Montclair, N. J.



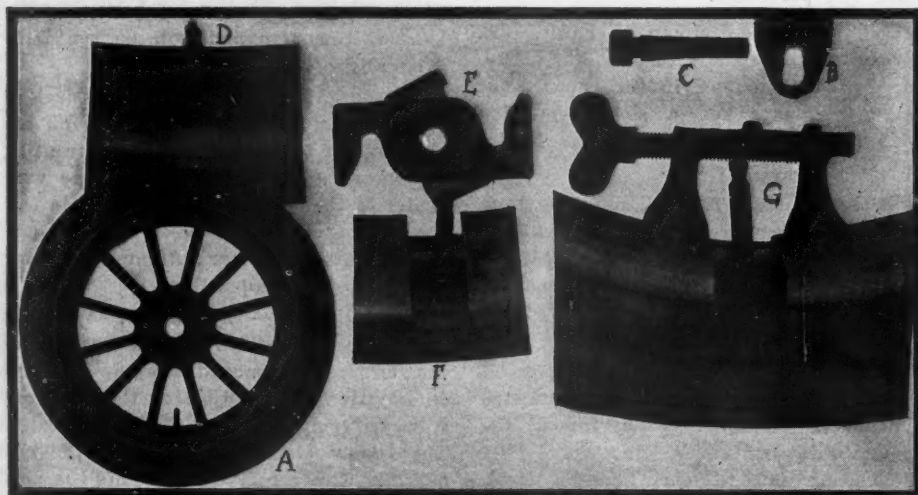
Development Briefs



THE COMBINED MOTOR AND GENERATOR OF THE APLCO SELF-STARTING SYSTEM

Detroit Demountable Rim

A NEW demountable rim of the bolted-on type has appeared under the name of the Detroit demountable rim. The illustrations show the general features of the construction. The complete wheel fitted with



FEATURES OF THE DETROIT DEMOUNTABLE RIM

this rim is shown at A. The six draw bolts C have tapered shanks which are turned down just under the bolt head to the diameter of the threads. This construction permits the use of a draw flange back of the wedge without weakening the bolt. The bolt passes through the bottom part of the slot in the wedge B and moves upward automatically when placed in position in the wheel felloe, so that when the bolt is removed the wedge comes with it. The bolts screw into brass nuts fixed in the other side of the felloe.

At D is shown the rim at the valve stem after removal from the wheel. A section of the rim is cut out, the loose section being held in place by the locking device shown. At F is illustrated the loose rim with the locking section E removed. This rim is marketed by the Snyder & Harbridge Selling Co., Detroit. To facilitate the removal of the tire when it has become rusted to the rim after long service, a spe-

cial rust-breaking tool is provided. This is illustrated at G and may be used for expanding or contracting the rim as desired.

Aplco Self-Starter

An electrical starting mechanism has just been brought out by the Apple Electric Co. of Dayton, O., as a development of its electric lighting system for motor cars. With the new arrangement, the device not only furnishes current for ignition and electric lights for the car but performs the duty of cranking the motor as well.

In a general way the new arrangement is much like the regular installation for lighting produced by this firm. For lighting and ignition, a small electric generator driven by the motor is used to supply current, which keeps a storage battery constantly charged. This in turn furnishes the power for the lights and ignition of

line of supplementary springs to be inserted in the ends of the regular ones. As will be seen from the illustration of this attachment to the rear spring, the torsion spring consists of two coil springs placed horizontally. In installing these they are simply substituted for the connecting links, and can be used on the front springs as well as on the rear ones. It is claimed that a set of these will add 18 square feet to the total effective spring area.

Klaxonet in New Form

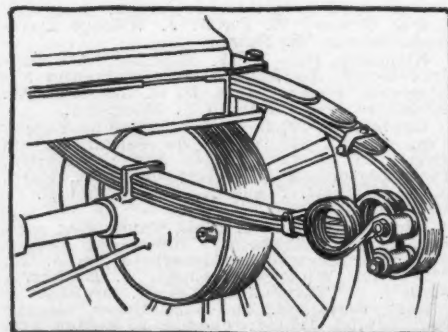
The Lovell-McConnell Mfg. Co., Newark, N. J., maker of the Klaxon line of electric signals has brought out a new type of the smaller signal, known as the Klaxonet, in which the long projector is used. The appearance of the new Klaxonet is much like that of the larger Klaxons, and the signal range is increased at the same time.

A combination Klaxonet has been brought out also in which the reed horn is fitted to the projector Klaxonet. The tone and range power of the reed horn is strengthened by the diaphragm and projector. With this signal the driver has both a loud and soft warning sound as occasion requires.

The loud signal is produced by pressing the button which operates the Klaxonet proper, and the soft sound by pressing the bulb of the reed horn.

Pittsfield Marine Coils

Vibrating coils designed for marine work but which are intended also for use on motor trucks are being manufactured by the Pittsfield Spark Coil Co. of Dalton, Mass. These coils are especially sturdy and economical, making them particularly well adapted for the two classes of work. They are insulated with a special compound, which renders them practically impervious to oil and water. The vibrators are of a new design and are very fast and economical of current. Extremely large iridio-platinum contact points constitute one of the features of these coils. The units are assembled in neat and durable oak boxes which can be laid down or screwed to the dash in an upright position by means of extensions on the ends of the boxes.



ACME TORSION SPRINGS SHOWING THE APPLICATION TO THE REAR SPRING OF A MOTOR CAR, REPLACING THE LINKS

the motor. In the new system the generator is arranged to be operated as an electric motor when supplied with current from the battery and turn the engine over until it takes up its regular cycle of operations.

Solder in Handy Form

Solderall is the name of a new solder combined with non-corrosive flux in paste form and put up in tubes so that it may be carried in the pocket or tool box. In use the paste is squeezed out of the tube upon a joint and heated with a match, torch or soldering iron. In addition to its use in motor-car repair it is applicable to soldering kitchen utensils, electrical and other work. This solder is manufactured by the Solderall Co., New York.

Acme Torsion Springs

In order to assist the regular springs of the car in relieving the body and frame of the road shocks, the Acme Torsion Spring Co. of Boston has brought out a